Question bank

Chapter-1 Term 1 Whole numbers and decimal numbers

Q-1 **Solve:**

a) $9\blacksquare \times 9\blacksquare$

b) $8\blacksquare \times 8^{1}\blacksquare$

c) $2\blacksquare \times 2^{1}\blacksquare$

Q-2 **Simplify, leaving your answer in index form.**

a) $v\blacksquare \times v\blacksquare$

b) $p^{3} \times p\blacksquare$

c) $q\blacksquare \times q^{11}$

Q-3 **Simplify, leaving your answer in index form.**

a) $x^{12} / x\blacksquare$

b) $v\blacksquare \times v\blacksquare / v\blacksquare$

c) $v^{12} / v^{1}\blacksquare$

Q-4 **Simplify, leaving your answer in index form.**

a) $3^{2}\blacksquare \div 3\blacksquare$

b) $5^{1}\blacksquare \div 5^{1}\blacksquare$

c) $8\blacksquare\blacksquare \div 8^{2}\blacksquare$

d) $u^{1}\blacksquare \div u^{13}$

e) $r^{21} \div r^{1}\blacksquare$

Q-5 **Write down the value of these numbers.**

a) $10\blacksquare$

b) $17\blacksquare$

c) $(-20)\blacksquare$

d) $1\,500\blacksquare$

e) $3\,000\blacksquare$

Q-6 **Write these numbers in index form, with negative indices.**

a) $1 / 3^{1}\blacksquare$

b) $1 / 5\blacksquare$

c) $1 / 1\,000$

d) $1/6^{\blacksquare}$

e) $1/34^{3}$

Q-7 **Write these numbers as reciprocals, with positive indices.**

a) $3^{\blacksquare\blacksquare}$

b) $7^{\blacksquare\blacksquare}$

c) $11^{\blacksquare\blacksquare}$

Q-8 **Simplify the following fractions, leaving your answers in index form with negative indices.**

a) $y^{\blacksquare}/y^{\blacksquare}$

b) $x^{\blacksquare}\, y^{\blacksquare}/x^{\blacksquare}\, y^{12}$

Q-9 **Use Law 4 and Law 5 to simplify the following numbers. Leave your answer in index form.**

a) $(5^{3})^{\blacksquare}$

b) $(8^{\blacksquare})^{\blacksquare}$

c) $(2^{\blacksquare 3})^{\blacksquare\blacksquare}$

d) $(2^{\blacksquare\blacksquare})^{\blacksquare 1/\blacksquare}$

e) $(7^{3})^{\blacksquare 2}$

Q-10 **Put these numbers in order of size, starting with the largest number.**

a) $6 \times 10^{\blacksquare}$, 0.076, $9.2 \times 10^{\blacksquare}$, $4 \times 10^{\blacksquare 3}$, 67 000

b) $2 \times 10^{\blacksquare 1}$, 203, 47.6, 3.1×10^{1}, 0.09

c) 45 000, $4 \times 10^{\blacksquare}$, $5.7 \times 10^{\blacksquare\blacksquare}$, $9 \times 10^{\blacksquare\blacksquare}$, $2 \times 10^{\blacksquare}$

d) 0.004, $3 \times 10^{\blacksquare 2}$, 0.9, $8 \times 10^{\blacksquare\blacksquare}$, $6.4 \times 10^{\blacksquare 3}$

e) 0.09, $5 \times 10^{\blacksquare 3}$, 0.5, $8 \times 10^{\blacksquare\blacksquare}$, $5.4 \times 10^{\blacksquare 2}$

Q-11 **These numbers are written in standard form. Convert them to ordinary numbers.**

a) 1.4×10^{2}

b) 2×10^{3}

c) 6.3×10^{1}

d) 4.52×10^{2}

Q-12 **Write these numbers in standard form.**

a) 23.5

b) 93 400

c) 207

d) 7 210 000

e) 1.32

f) 930 000 000

Q-13 **These numbers are given in standard form. Write them as ordinary numbers.**

a) 2×10^{1}

b) $4.1 \times 10^{}$

c) $5.63 \times 10^{}$

d) $3.1 \times 10^{}$

e) 6×10^{2}

f) 1.8×10^{3}

Q-14 **Write these numbers in standard form.**

a) 0.4

b) 0.0023

c) 0.045

d) 0.9

e) 0.83

f) 0.006

Q-15 **A crowd at a football match is estimated to be 46 300 people. Write this number in standard form.**

Q-16 **It takes light approximately $3.05 \times 10^{}$ seconds to travel 100 m. Write this in normal decimal form.**

Q-17 **The fastest fighter jet on the planet travels at a speed of Mach 3, approximately $3.675 \times 10^{}$ km/h. What is Mach 3 as a whole number?**

Q-18 **List all the factors of the following.**

a) 10

b) 18

c) 37

d) 52

e) 120

Q-19 **The Sieve of Eratosthenes is an ancient method for finding all prime numbers up to a specified number. It was created by Eratosthenes (275–194 B.C.), an ancient Greek mathematician. The numbers from 1 to 100 are listed in the table below. We use the Sieve of Eratosthenes to find all prime numbers up to the number 100. Follow the directions: • Cross out 1 because it is not prime. • Circle 2 because it is the smallest prime number. Cross out every multiple of 2. • Circle the next open number, 3. Now, cross out every multiple of 3. • Continue this process until all numbers in the table have been circled or crossed out. • When complete, you will have all the prime numbers from 1 to 100.**

Q-20 **List the first seven prime numbers.**

Q-21 **Say whether the following numbers are prime, composite or neither. Give a reason for your answer.**

a) 12

b) 19

c) 81

d) 54

e) 250

f) 163

Q-22 **From the numbers {1, 2, 3, 4, 7, 9, 12, 18, 19, 24, 27, 48, 80, 84, 92, 96}, select the following:**

a) factors of 12

b) multiples of 12

c) Prime numbers

d) even prime numbers

Q-23 **Write the following in index notation.**

a) $2 \times 2 \times 3$

b) $2 \times 3 \times 3 \times 5$

c) $5 \times 5 \times 7 \times 13 \times 13$

Q-24 **Write the following as the product of prime factors by completing the ladder.**

a)

b)

c)

Q-25 **Find the prime factors of the following numbers. Leave your answer in index notation.**

a) 50

b) 225

c) 216

d) 486

e) 965

Q-26 **Find the HCF of the following terms.**

a) $2 \times 2 \times 3$ and $2 \times 2 \times 3 \times 5$

b) $2 \times 2 \times 3 \times 3 \times 7$ and $2 \times 3 \times 3 \times 7$

c) $3^3 \times 3 \times 5^2$ and $2^2 \times 5 \times 7$

d) $2\blacksquare \times 5^3 \times 7^2$ and $2^3 \times 5 \times 7$

Q-27 **Find the HCF of the following pairs of numbers.**

a) 75 and 90

b) 84 and 92

c) 216 and 360

d) 288 and 360

Q-28 **Solve:**

a) Square tiles are placed on a floor measuring 1 650 cm by 1 275 cm. If the tiles are all alike, find the largest size they can be. How many such tiles can conveniently fit on the floor? (No tiles can be cut.)

b) A hall measures 120 m by 240 m. Find the maximum side length of the square tiles that can be used to tile the floor, if no tiles can be cut. How many such tiles will be needed?

c) A man left a rectangular piece of land measuring 90 m by 120 m, to be shared equally among his children. Before he died, he said that each child must receive a square plot. How many children did he have?

d) A certain college has a packing store measuring 126 m by 234 m by 90 m for students to store their boxes. If only boxes in the form of cubes are accepted, find the largest dimensions each box can have. How many such boxes can possibly fit into the store, if they are all alike?

e) A carton in the form of a cuboid measuring 22 cm by 33 cm by 44 cm contains cubes of sugar. Find the largest possible dimension of the cubes of sugar. How many such cubes of sugar can possibly fit into the carton?

f) A rectangular field measures 308 m by 228 m. Square plots are to be marked out in this field, all plots being alike. How many plots can be marked out?

Q-29 **Write down the first six multiples of the following numbers.**

a) 4

b) 8

c) 9

d) 15

e) 20

Q-30 **Find the LCM of the following terms.**

a) $2^3 \times 3^2 \times 7$ and $2^2 \times 3^3 \times 5$

b) $2 \times 3 \times 3 \times 5$ and $2 \times 2 \times 3 \times 3 \times 3$

c) $2 \times 2 \times 2 \times 3 \times 3 \times 7$ and $2 \times 2 \times 3 \times 3 \times 3 \times 5$

d) $2^2 \times 3^3 \times 5^2$, $2\blacksquare \times 3^3 \times 5^2 \times 7$ and $2 \times 3 \times 7^2$

e) $2 \times 3^2 \times 5$, $2^2 \times 3 \times 5$ and $2 \times 3 \times 5^2$

Q-31 **Determine the LCM of the following.**

a) 12 and 18

b) 6 and 16

c) 30 and 128

d) 15, 30 and 45

e) 32, 40 and 48

Q-32 **Kola is planting trees. He has enough trees to plant 6, 7, or 14 trees in each row. What is the least number of trees Kola could have?**

Q-33 **At a dance ceremony, three drums are beaten at intervals of 18 s, 27 s and 36 s respectively. All drums start together. Find how long it will take until the drums next beat together.**

Q-34 **A band rehearses with either six or 10 members in every line. What is the least number of people that can be in the marching band?**

Q-35 **Determine the following without a calculator, and by using prime factors.**

a) $\sqrt{81}$

b) $\sqrt{196}$

c) $\sqrt{676}$

d) $\sqrt{484}$

e) $\sqrt{841}$

f) $\sqrt{289}$

Q-36 **Determine.**

a) √(25/196)

b) √(81/49)

c) √(121/81)

d) √(5/320)

e) √(384/54)

Q-37 **Fill in the next three numbers in each sequence. Describe a rule for the number pattern.**

a) 9, 13, 17, 21, …

b) 25, 31, 37, 43, …

c) 36, 33, 30, 27, …

d) 38, 32, 26, 20, …

Q-38 **Fill in the missing numbers. Describe a rule for the number pattern.**

a) ___, ___, 41, 36, 31, 26

b) ___, ___, 49, 55, 61, 67

c) 75, 69, ___, 57, 51, ___

d) ___, 37, ___, 27, ___, 17, 12

Q-39 **Find the difference between each term. Then, write down the next three terms in the following number patterns:**

a) 12, 6, 0, ___, ___, ___

b) 15, 10, ___, ___, ___

c) –50, –40, –30, ___, ___, ___

d) 10, 8, 6, ___, ___, ___

e) 2, 4, 8, 16, ___, ___, ___

f) 3, 5, 9, 17, ___, ___, ___

Q-40 **The next number patterns are more challenging. Find the next term in each pattern and give a reason for your answer.**

a) 1, 4, 9, 16, …

b) 1, 3, 6, 10, …

c) 2, 2, 4, 6, 10, 16, 26, …

d) 2, 3, 5, 9, 17, 33, …

Chapter-2 Term 1 Fractions

Q-1 **Separate these numbers into proper, improper and mixed fractions.**

a) 11⁄7

b) 5⁄12

c) 2 7⁄8

d) 12

e) 999⁄1000

Q-2 **Write these fractions as improper fractions.**

a) 1 2/9

b) 2 1/2

c) 3 3/8

d) 3 3/5

e) 6 10/11

f) 15 4/15

g) 100 7/10

h) three and four■fifths

i) six and five■sevenths

Q-3 **Write these fractions as mixed fractions.**

a) 15/11

b) 14/3

c) 4/3

d) 13/7

e) 21/5

f) 501/7

g) 1000/33

h) 17 sixths

i) 50 ninths

j) 27 eighths

Q-4 **Write these fractions in their simplest form. Which of them are the same as 3⁄4?**

a) 9⁄12

b) 9⁄15

c) 15⁄20

d) 24⁄28

e) Which of the fractions in (a) to (d) are equivalent fractions?

Q-5 **Which is bigger, 1⁄5 or 3⁄20? Which is smaller, 4⁄7 or 5⁄9?**

a) Which is bigger, 1⁄5 or 3⁄20?

b) Which is smaller, 4⁄7 or 5⁄9?

Q-6 **Arrange the fractions from the smallest to the biggest.**

a) 3⁄4, 1⁄2, 5⁄8

b) 5⁄8, 4⁄3, 5⁄6

Q-7 **In the diagrams below, the shaded portions of the circles all represent the same portion of the whole circle. What fraction represents the shaded portion in each circle?**

Q-8 **Write down these fractions as decimals.**

a) 7 ⁄ 100

b) 18 ⁄ 100

c) 51 ⁄ 1000

d) 15 ⁄ 10

Q-9 **Convert these proper fractions to decimal fractions.**

a) 3 ⁄ 5

b) 3 ⁄ 4

c) 16 ⁄ 25

d) 1 1 ⁄ 5

e) 136 ⁄ 250

f) 28 ⁄ 500

Q-10 **Copy and complete the boxes.**

a) 0.52 = [ ] units [ ] tenths [ ] hundredths

b) 4.07 = [ ] units [ ] tenths [ ] hundredths

c) Thirty eight hundredths = 0.[ ]

d) 11.42 = eleven and forty■two = [ ]

Q-11 **Write these fractions as decimals.**

a) 3/8

b) 13/25

c) 15/16

d) 7/5

e) 1 3/4

Q-12 **Write the following decimal numbers as fractions.**

a) 0.03

b) 0.44

c) 0.105

d) 2.025

e) 0.1523

Q-13 **Copy and complete the table below.**

Input diagram

Q-14 **Change the following fractions to percentages.**

a) 40 / 100

b) 19 / 50

c) 17 / 50

d) 1 / 20

e) 8 / 25

f) 13 / 20

Q-15 **Convert the following decimal numbers to percentages.**

a) 0.25

b) 0.831

c) 0.17

d) 0.04

e) 0.875

f) 0.49

Q-16 **Express the following percentages as fractions, simplifying each answer to its lowest term.**

a) 10 %

b) 16 %

c) 25 %

d) 56 %

e) 33 %

f) 33 ⅓■ %

Q-17 **Write the following percentages as decimal numbers.**

a) 80 %

b) 34 %

c) 19 %

d) 13 %

e) 71 %

f) 0.5 %

Q-18 **Look at the diagram on page 23 again.**

a) How many small blocks make up 100 % of the diagram?

b) Write 100 % as a fraction.

c) Write 100 % as a decimal.

Q-19 **Arrange these sets in descending order.**

a) 70 %, 3⁄4, 30.76

b) 0.87, 85 %, 5⁄6

c) 25 %, 1⁄5, 0.23

d) 7⁄20, 12 %, 0.35

e) 0.375, 37 %, 2⁄5

Q-20 **Find:**

a) 70 % of 1 500

b) 58 % of 4 000

Q-21 **Egbeda bought a computer game that was to be sold for N64 000 at a discount of 25%. How much did she pay for the game?**

Q-22 **In a college, there are 800 students, of which 500 are girls.**

a) What percentage of the students are girls?

b) What is the percentage of boys in the college?

Q-23 **A high school has 4 000 students. During an assembly, only 3 750 students were present.**

a) What percentage of students was present?

b) How many students were absent?

Q-24 **Nsedu has to buy an article for N12 000. She finally paid N10 200 for it. What percentage of the amount is the discount?**

Q-25 **Ogbonna earns N250 000. Every month, he divides his salary as follows: N100 000 for savings; N75 000 for food; N25 000 for health care.**

a) How much of his salary is left after these expenses?

b) What percentage of his salary does he save?

c) What percentage of the salary is left after all expenses are deducted?

Q-26 **In a class of 36 students, 75% passed the promotion examination.**

a) How many students passed the promotion examination?

b) How many of the failed the promotion examination?

Q-27 **Simplify these ratios.**

a) 2 cm : 5 cm

b) 1.5 kg : 800 g

c) 100 cm : 6 m

d) 11 % : 17 %

e) 1 / 4 : 2 / 7

f) 0.5 : 0.75

Q-28 **Mr Dike has 15 domestic animals of which six are cats, four are dogs and five are goats. Find the ratio of the number of:**

a) dogs to goats

b) cats to dogs

c) cats to goats

d) goats to dogs

e) dogs to cats to goats

Q-29 **The rectangle P has a length of 3 m and a width of 1 m, while rectangle Q has a length of 6 m and a width of 4 m.**

a) i) the length of P to the length of Q ii) the width of Q to the width of P iii) the area of P to the area of Q

Q-30 **A class has 60 students. There are 28 girls and 32 boys.**

a) boys to girls b) girls to the total number of students

Q-31 **Akiakeme is 14 years old and Edidiong is 12 years old. Their father shares ■52 000 between them in the ratio of their ages.**

a) How much does each receive?

b) Write these two amounts as proper fractions, decimal fractions, and percentages of the total

Q-32 **A bag contains blue, green and yellow balls in the ratio 2 : 2 : 3. If there are 35 balls altogether, how many balls of each colour are there?**

Q-33 **A man's wage in a month is divided as follows: Savings = 30%; Food = 40%; Health care = 10%. He gives the rest to his parents.**

a) Write down the ratios of savings to food, and savings to health care to food

b) If the amount for health care is ■15 000, find his wage for the month c) What percentage did he give to his parents? d) What amount did he give to his parents?

Q-34 **In the school library,2/3 of the books are science books. There are 7 131 books in total.**

a) What is the ratio of science to non■science books?

b) There are 7 131 books in the library. How many of them are nonscience books?

Q-35 **One bag of fertilizer is needed for a farm of 2 hectares. How many bags of fertilizer are required for a farm of 7 hectares?**

Q-36 **To lay the floor of a room, Ifekristi needs four bags of cement. For every one bag of cement Ifekristi uses three wheelbarrows of sand. Find how many wheelbarrows of sand he will need to lay the floor.**

Q-37 **Mr Momoh mixes 2 kg of flour with seven eggs to make enough cake for eight people. If twelve people are visiting him, what proportions of flour and eggs will he mix?**

Q-38 **A woman gets ■600 for rendering 5 hours' worth of services. How much would she get for:**

a) 1 hour

b) 12 hours

Q-39 **A boy buys five pens for ■200. How much will 2 dozen cost?**

Q-40 **Five students can sweep their dormitory in an hour. How long will it take:**

a) one student

b) three students

Q-41 **It costs ■150 000 to rent a house. Express this as a monthly rate.**

Q-42 **A taxi driver travels 10 km per litre of petrol with his car. Find how much petrol the car uses in covering 700 km.**

Q-43 **Give three of your own examples of rate.**

Chapter-3 Term 1 Transactions in the home and office

Q-1 **Mr and Mrs Nwandu have decided that they need to start saving money to go on holiday in December. They draw up a budget and work out how much money they are able to save for the holiday. They decide to save all the money left over after their expenses for their holiday. Monthly income: Salary after deductions ■415 000; Rent income ■64 000. Monthly expenditure: Pension ■18 300; Medical aid ■82 000; Insurance ■34 000; Water and refuse ■5 000; Electricity ■17 000; Car repayment ■45 000; School fees ■20 500; Food ■45 000; Clothing ■12 500; Petrol ■18 300; Entertainment ■13 000; Mobile phone ■11 500; Savings (9 % of total income).**

a) Calculate the amount of money that the Nwandu family can save every month.

b) Calculate the total expenditure of the Nwandu household.

c) If Mr and Mrs Nwandu save for six months, calculate the total amount of money saved for their holiday.

Q-2 **Bako earns ■30 000 per week, plus 38 % commission. He sells ■1 500 in one week. What is his gross weekly earning?**

Q-3 **Efe draws up the following budget for maintaining her car over 12 months: Car licence ■3 740; Tyres (4 needed) ■11 800 per tyre; Service ■7 260; Insurance ■3 880 per month; Wheel alignment ■2 910; Grease and oil change ■5 335.**

a) How much will she pay annually for insurance?

b) Calculate the total cost to replace four tyres.

c) What is the total amount for car maintenance for 12 months?

d) Calculate the average cost per kilometre, if the car was driven 10 265 km during the 12 months.

Q-4 **The table below shows a summary of the water account for Mr DG Bakare for a period of eight months. The first 5.6 kilolitres (kl) used for each month is free. (Remember 1 000 l = 1 kl.)**

a) How many litres of water were consumed in September?

b) What is the highest amount that Mr Bakare paid for water?

c) In which month did Mr Bakare pay the least for water used?

d) Now complete the outstanding values for the table above. Write down the question numbers (i)–(iv) and show all calculations next to it.

e) The water usage for August was 22 kl and for September it was 28 kl. Calculate the percentage increase for the total number of kilolitres (kl) of water used for August and September.

f) Calculate the total amount paid by Mr Bakare for water from August to January

Q-5 **Below is a mobile phone account and tariff schedule for Ekong. a) Is a cell phone account a variable or fixed expense? Give a reason for your answer. b) Based on the information above, calculate what the cost of Ekong's phone bill will be.**

a) Is a cell phone account a variable or fixed expense? Give a reason for your answer.

b) Based on the information above, calculate what the cost of Ekong's phone bill will be.

Q-6 **Calculate the simple interest (SI) on N65 000 at 11.5% p.a. for 4½ years.**

Q-7 **Yabani lent his sister ■10 000 at 12% p.a. simple interest. She repaid him after 3 years. How much did Yabeni receive?**

Q-8 **An amount of ■60 000 is invested in a savings account that pays simple interest at a rate of 7.5% p.a. Calculate the balance accumulated at the end of 2 years.**

Q-9 **Calculate the accumulated amount in the following situations.**

a) A loan of ■80 000 at a rate of 8% for 1 year

b) An investment of ■550 000 at a rate of 12.5% p.a. for 6 years

Q-10 **Calculate the value of an investment of ■16 000 at 9% simple interest p.a. for 36 months.**

Q-11 **Aderibigbe invested ■72 500. After 8 years his investment is worth ■87 700. Calculate the interest rate he earned.**

Q-12 **Akanmu invested ■65 000 at 8¾% simple interest for a certain period. If he has ■81 477.50 at the end of the investment, how long did he invest his money for?**

Q-13 **A woman invests a certain amount of money at 5.5% p.a. for 9 years. At the end of the period, she has earned interest of ■12 375. What was the amount she originally invested?**

Q-14 **How long will it take for an investment of ■6 000 to grow to ■8 160 if it is invested at a simple interest rate of 9% p.a.?**

Q-15 **Adama borrowed ■2 500 from Jabe for 2 years. Jabe requires that Adama pay him ■3 200 after 2 years. What is the interest rate?**

Q-16 **Ozioma wants to buy a hi■fi system from Advanced Sound Systems for N75 000. He considers buying the system on hire purchase. What would Ozioma's monthly repayments be, if she were to buy the hi■fi system on the hire purchase terms on the right?**

Q-17 **Utibe decides to buy a television. He cannot afford the cash price of N37 000, so he purchases it on a hire purchase agreement with the following terms over 2 years: • A compulsory 15 % deposit is payable. • Interest is charged at 16 % p.a.**

a) How much interest does Utibe pay?

b) How much does he pay in total?

c) How much will his total monthly repayments be?

Q-18 **Mrs Eze wants to purchase a new dining room table for N220 000 from Help Stores. She enters into a hire purchase agreement with Help Stores, with the following terms: • must pay a 12 % deposit • will be charged 11 % p.a. simple interest on the balance • must pay the outstanding balance over 3 years, in equal monthly instalments.**

a) What deposit will Mrs Eze pay?

b) After paying the deposit, what amount is still outstanding?

c) How much interest will she pay in the three years?

d) What will her monthly instalments be?

e) How much did she end up paying for the table?

Q-19 **Use these previous and current electricity meter readings in a given period to calculate the number of energy units used.**

a) previous reading = 8570, current reading = 9745

b) previous reading = 5459, current reading = 7893

c) previous reading = 8009, current reading = 78923

Q-20 **A business uses 680 units of electricity in one month. Electricity is charged at ■14.40 per unit, and the monthly demand charge is ■750 with VAT at 5%. Calculate the electricity account for the business for the month.**

Q-21 **Electricity is charged at ■14.40 per unit. VAT at 5% is applied to the cost of electricity and the demand charge is ■1 250. Use the above information to find the cost of the following usages:**

a) 620 units

b) 1 020 units

c) 780 units

d) 855 units

Q-22 **In the first quarter, the reading on Mr Adigun's meter changed from 40 789 to 41 769. The cost of electricity is ■14.40 per unit. The demand charge is ■750 and VAT is 5%. Calculate:**

a) The number of units used.

b) The cost of electricity.

c) The total electricity bill including VAT.

Q-23 **A householder receives an electricity bill of ■1 300.00 from IKEDC including VAT. The demand charge is ■750. The cost per unit is ■14.40.**

a) Calculate the number of units used.

b) If the previous reading on the meter was 68 008, work out the current reading.

Q-24 **For each of the listed items, find the discount amount and selling price.**

Q-25 **Nagodeallah is given a 5% discount on a shirt that costs N1 900. How much discount does Nagodeallah receive?**

Q-26 **How much will you pay for a pair of jeans, if they cost N3 700 and you are offered a 15% discount?**

Q-27 **A shop advertises a 33% discount on all goods in the shop. How much will you pay for a pair of pants that were on sale for N2 935?**

Q-28 **A supermarket advertises that they are selling bottles of cooking oil that cost N223 at a discounted price of N215. Calculate the percentage discount (to one decimal place).**

Q-29 **A car salesman earns commission of 2K in the naira. Calculate his commission, if he sells cars worth ■1 200 000 in one week.**

a) A car salesman earns commission of 2K in the naira. Calculate his commission, if he sells cars worth N1 200 000 in one week.

b) An agent earns commission of 10% for each plot sold. If he sold four plots of land in one month, how much will he earn as commission?

c) For every ticket issued at the train station, an agent gets a commission of ■150 for 5 tickets sold. How much will she get for selling 625 tickets?

d) A bank charges 2½% commission for issuing a bank draft. Calculate the value of the bank draft, if a customer has to pay ■365 250 to get it from the bank.

e) A bookseller gets a 7% commission on his sales. What is the total commission for selling 30 Mathematics textbooks at ■750 each, 14 Science textbooks at ■630 each, and 45 Mathematical sets at ■150 each?

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Q-34 **Toben bought a book for ■10 000 and sold it to Bolu for ■9 000.**

a) What amount did he lose?

b) What was his percentage loss?

Q-35 **Make a copy of this table and complete it by calculating the profit or loss on each item as a percentage of the cost price.**

Q-36 **To attract more passengers, a travel agency decides to reduce transport fares from ■4 000 to ■2 500 from Jibade to Biyi. What is the percentage loss this travel agency incurred?**

Q-37 **The price of kerosene increased by 20%. If the initial cost was ■200 per can, what was the new price?**

Q-38 **A businessman is in financial difficulty and decides to sell his car that cost him ■2 000 000 for ■1 750 000. What is the percentage decrease in the price of his car?**

Q-39 **In each of the cases below, find (a) the profit or loss and (b) the selling price for an item with each of these cost prices.**

a) ■4 000; profit 25%

b) ■900; profit 15%

c) ■375; loss 4%

d) ■7 500 000; loss 10%

Q-40 **In each of the following cases, find (a) the actual profit or loss and (b) the percentage profit or loss.**

a) Cost price ■800; Selling price ■3 250

b) ■420; ■350

c) ■7 200 000; ■6 480 000

d) ■96 000; ■132 000

Q-41 **A woman buys a pair of shoes for ■40 000. She sells it at ■33 000. What is her percentage loss?**

Q-42 **A carpenter bought wood for ■18 000. He bought other material for ■6 000 and used it to make a bed, which she sold for ■30 000. What was his percentage profit?**

Q-43 **A laptop is sold for ■100 000, which represents a loss of 13%. What was the cost price?**

Q-44 **A camera is sold for ■51 000. The profit mark up on the camera is 70%. Calculate the cost price of the camera.**

Q-45 **Complete the table.**

Q-46 **A person with five children earns ■72 640 per month.**

a) Calculate the tax allowances

b) Calculate the taxable income

c) Calculate the amount of tax paid

d) Calculate the income after tax is paid

Q-47 **A man has three children. His monthly income is ■56 250, and he claims ■2 500 for a dependent relative.**

a) Calculate his allowance

b) Calculate his taxable income

c) Calculate the amount of tax he pays

Q-48 **A husband and wife are both teachers. They each get a monthly salary of ■84 000. They have four children, and the husband claims ■2 000 for a dependent relative. Assuming the wife claims for the children, calculate:**

a) the husband's tax payable

b) the wife's tax payable

Q-49 **Calculate the selling price of the following items at 5% VAT.**

a) A radio that costs ■4 000

b) Standing fan that costs ■13 000

c) A car that costs ■550 000

Q-50 **Adeyanju bought a photocopier for ■16 000 excluding VAT. If the rate of VAT is 8%, calculate the amount he paid for the photocopier.**

Q-51 **A pair of sneakers costs ■3 500 including VAT at 7%. Calculate the cost of the sneakers excluding VAT.**

Q-52 **A new car costs ■750 000, including VAT at 8%.**

a) Calculate the cost of the car excluding VAT.

b) Find the VAT amount to the nearest Naira.

Chapter-4 Term 1 Approximation and estimation

Q-1 **Write these numbers correct to the nearest whole number.**

a) 18.17

b) 91.26

c) 30.8

d) 0.27

e) 0.87

f) 3.58

g) 102.76

h) 286.1

i) 20.916
j) 311.91

Q-2 **Write the following numbers, correct to the nearest ten.**

a) 18.27
b) 36.81
c) 129.7
d) 384.1
e) 483.9
f) 452
g) 1 589
h) 2 598
i) 1 043
j) 8 079

Q-3 **Write these numbers correct to the nearest unit.**

a) 0.961
b) 21.01
c) 11.81
d) 189.2
e) 298.9
f) 389.8
g) 3.47
h) 130.2
i) 240.6
j) 545.5

Q-4 **Write these numbers correct to the nearest hundred.**

a) 1 048
b) 5 960
c) 2 577
d) 48
e) 87
f) 897
g) 994
h) 8 979
i) 898.5
j) 1 925

Q-5 **Write these numbers correct to the nearest thousand.**

a) 1 999

b) 2 004

c) 1 849

d) 1 469

e) 5 814

f) 29 034

g) 31 480

h) 21 111

i) 54 671

Q-6 **Write each of the following numbers correct to the required number of significant figures.**

a) to 1 s.f.: i) 4 521 ii) 16.5 iii) 0.43 iv) 0.0711 v) 0.0086

b) to 2 s.f.: i) 197.746 ii) 95.0745 iii) 369.047 iv) 0.0701 v) 0.0485

c) to 3 s.f.: i) 28.7046 ii) 37.074 iii) 12.074 iv) 0.04755 v) 0.00941

Q-7 **Write each of the following numbers correct to the required number of decimal places.**

a) to 1 d.p.: i) 4 631 ii) 6.5 iii) 0.34 iv) 0.0801 v) 0.0078

b) to 2 d.p.: i) 56.384 ii) 66.518 iii) 0.7471 iv) 0.0802 v) 0.006775

Q-8 **Correct each number to one significant figure, and then estimate the value of each product.**

a) 44 × 28

b) 47 × 62

c) 4.9 × 81

d) 1.8 × 720

e) 440 / 38

f) 930 / 43

g) 8.1 / 49

h) 29 / 0.72

Q-9 **For each question decide by estimating which answer in the brackets in the right■hand column is correct.**

a) 7.2 × 9.8 (52.16, 98.36, 70.56)

b) 0.21 × 93 (41.23, 19.53, 9.03)

c) 13.92 ÷ 5.8 (0.52, 4.2, 2.4)

d) 159.65 ÷ 515 (0.11, 3.61, 0.31)

Chapter-5 Term 1 Basic operations

Q-1 **Use tables to determine the following.**

a) $\sqrt{3.4}$

b) $\sqrt{44.721}$

c) $\sqrt{35}$

d) $\sqrt{89.2}$

e) $\sqrt{50.01}$

f) $\sqrt{82.99}$

Q-2 **Use the number line above to complete these statements. Write the missing numbers as directed numbers.**

a) The point A is … units from D.

b) The point O is … units from B.

c) The point C is … units from E.

d) The point O is … units from A.

e) The point E is … units from E.

Q-3 **Find the value of these calculations.**

a) +5 + +4

b) -9 + +8

c) +4 + -7

d) -5 + +10

Q-4 **Find the image of each of these numbers.**

a) –40

b) 51

c) 100

d) 0

Q-5 **Find the value of these calculations.**

a) +8 + +7

b) +56 + +21

c) +8 + –3 + +4

d) +14 + –20 + +3 + +7

e) +123 + +36 + –25

f) –9 + +11

Q-6 **Write an addition expression for each of these number lines.**

a)

b)

c)

Q-7 **Find the value of each expression below. Use a number line to show how you work out the answer.**

a) +8 – +5

b) +33 – +20

c) +9 – +12

d) –13 – +5

e) –9 – –3 – –2

f) +4 – –2 – +7 – +3

Q-8 **Do these subtractions without using a number line.**

a) –12 – +13

b) –30 – –30

c) –97 – –68

d) –108 – –157

e) –10 – –15 – +5 – +30 – +25

Q-9 **Find the value of these expressions.**

a) +3 × +8

b) –3 × +4

c) +6 × –12

d) –16 × –3

e) +10 × +3

f) +7 × +6

Q-10 **Find the value of these expressions.**

a) +5 × +7 × –1

b) –3 × +2 × +12

c) +6 × –10 × –2 × +5

d) –14 × –4 × –3 × –8

Q-11 **Find the values of these calculations.**

a) +32 ÷ +4

b) +42 ÷ –6

c) +35 ÷ –5

d) –45 ÷ +9

e) –27 ÷ +3

Chapter-5 Term 1 Multiplication and division of directed numbers

Q-1 **Simplify.**

a) 2 × y × 3 × z

b) 5a × 2b × 0

c) 5 × 4p × –2p × 3

d) 5z × 6y × 4x

e) ■/■m × –n × ⅔■m

Q-2 **Complete the tables below by writing down the product of the two terms in the top line.**

a)

b)

c)

d)

e)

Q-3 **Is each statement below true or false?**

a) ab = ba

b) 5gh = 5g × h

c) 3stu = 3s × 3t × 3u

d) 10bce = 2bc × 5e

e) 13mnx = 1 × 13mnx

Q-4 **Complete the following multiplication grids.**

a)

b)

Q-5 **Simplify by removing the brackets.**

a) 3(2f + 4)

b) 2(3a + 4)

c) 4(2e + 5)

d) 3(4t + 2)

e) 2(4y + 7)

f) 4(3r – 5)

Q-6 **Simplify.**

a) $x - 1 - (x - 1)$

b) $x - 1(x - 1)$

c) $10p - 4(2p - 5) + 4$

d) $14b - 3(4b - 3) - 5$

e) $16 - 2(3f + 5) - f$

f) $3x(x + 2) - (x - 4)$

Q-7 **Simplify by expanding the brackets.**

a) $(x + 3)(x + 2)$

b) $(a + 4)(a + 6)$

c) $(c + 3)(c + 4)$

d) $(r + 2)(r + 7)$

e) $(y + 3)(y + 5)$

f) $(t + 8)(t + 3)$

Q-8 **Simplify.**

a) $5a \div -3c$

b) $-27p \diagup 9$

c) $35x \div (-7)$

d) $(-t^2) \div (-2t)$

e) $(-20pq) \div 5q$

f) $-2a \diagup 2b$

Q-9 **If $p = -8$, $q = 5$ and $r = -10$, evaluate.**

a) $pq + r$

b) $p - q + 2r$

c) $(-5) \times p^2$

d) $4p - q + r$

e) $5pqr^3$

f) $-(pq) \times 2r$

Q-10 **Find the HCF of the following expressions.**

a) $x^2, -x^3$

b) t, t^2

c) $2x^2, 12x$

d) $36x^2, 18x^2$

e) u^2v, u^3v^2

f) x^3y^2, $-xy$

Q-11 **Complete the following table to factorise 3a + 6ab.**

a) …

b) …

c) …

d) …

e) …

3a + 6ab = …(… + 2b)

Q-12 **Fill in the missing values.**

a) 12k + 6 = 6(… + 1)

b) 4k + 4 = 4(… + 1)

c) 5m + 15 = (… + 3)

d) 12p – 4 = …(3p – 1)

e) 8k + 14 = 2(… + 7)

f) 2n – 10 = …(n – 5)

Q-13 **Fill in the empty cells to factorise the following expressions.**

a)

b)

c)

d)

e)

Q-14 **Factorise.**

a) 2x + 6

b) 4x + 12

c) 3t + 9

d) 5a – 20

e) 6y + 9

f) 4f – 10

Q-15 **Find the LCM of the following terms.**

a) 4y and 2y

b) 6c and 3d

c) $4a^2b$ and 2a

d) 5abc and $25a^2b^2$

e) 5x; 5xy; $10x^2y$

Q-16 **Simplify the following algebraic fractions.**

a) $4x^2/6x$

b) $10a^2/25ab^2$

c) $18pq/45pq$

d) $6x^2y/-3xy$

e) $-8ab^2/16ab$

Q-17 **Simplify.**

a) $a/7 + 2a/7$

b) $4a/5 + 2a/5$

c) $3x/8 - x/4$

d) $7x/10 - 2x/7$

e) $11x/4 - 2x/11$

f) $2/b - 3/c$

Q-18 **Simplify.**

a) $(a + b)/2 - 2a/5$

b) $(m + 1)/3 - (m - 2)/4$

c) $(2x - 1)/3 - (x - 1)/6$

d) $(3m + 4)/7 + (m - 1)/2$

e) $4(x + 1)/3 - 5(x - 2)/2$

f) $(6x + 2)/4 + (3x - 2)/3$

Chapter-6 Term 1 Algebraic expressions

Q-1 **Solve the following equations.**

a) $26 = 8 + v$

b) $3 + p = 8$

c) $15 + b = 23$

d) $-15 + n = -9$

e) $m + 4 = -12$

Q-2 **Solve the following equations.**

a) $9x - 8 = -6$

b) $9x - 7 = -7$

c) $-5 = -5 + 2z$

d) $8n + 7 = 31$

e) $-4 = 4 + x/2$

f) $9 + 9n = 9$

Q-3 **Solve for x.**

a) $9x - 13 = 10x$

b) $5x - 3 = 2x + 6$

c) $x + 2 = 2x - 1$

d) $-3x + 18 = 6 - x$

e) $16x = x$

f) $3x + 2 + 5x = x + 44$

Q-4 **Solve the following equations.**

a) $3(x + 2) = 27$

b) $-(2x + 9) = -10$

c) $3(2b - 1) = 2b + 5$

d) $3 - 2(a - 1) = 4a - 13$

e) $4(x - 2) = 3(x + 2)$

f) $3(x + 2) = 5(x - 2)$

Q-5 **Solve these equations for the unknown.**

a) $x/12 = 10$

b) $b/11 = 7$

c) $(s + 10)/16 = 4$

d) $(y + 5)/10 = 1$

e) $e/4 = 5$

f) $(18b + 8)/10 = 2$

g) $3(2c - 7)/4 = 7$

h) $2(4l - 10)/13 = 3$

Q-6 **Solve for the variable in each of the following.**

a) $2x/3 = 4$

b) $(x-1)/4 = x/7$

c) $4/5 + \nu = 41/20$

d) $-11/5 = -2 + n$

e) $a/15 + 5 = 8 + 9/30$

Chapter-7 Term 1 Simple equations

Q-1 **Write down an equation for each of the following word problems. You do not need to solve the equation.**

a) The sum of a certain number and six is 15.

b) The difference between a certain number and 20 is five.

c) The product of two and a certain number gives you 60.

d) The difference between a certain number and 30 is 20.

e) A certain number divided by four is 25.

f) If you multiply a certain number by three and then add four, you get 19.

g) If you multiply a certain number by five and then subtract three, you get 17.

h) Apples cost ■20 each. A number, a, of apples is bought at a total cost of ■460.

i) I think of a number, triple it, and add 10. The answer is 16. What is the number?

j) The area of a square is 16 cm^2. What is the length of one side?

k) The area of a rectangle is 72 cm^2 and the length of one of its sides is 4 cm. What is the length of the other side?

l) I think of a number, subtract eight, then double it and get 80.

Q-2 **Solve the following word problems by making an equation.**

a) If you multiply a number by five, you get the same answer as when you add eight to the number. Find the number.

b) I am thinking of a number. If I subtract 54 from double that number, my answer is 12. Find the number.

c) The perimeter of a rectangle is 27 cm. The sides are $2x – 5$; 5; x and $x + 3$ respectively. Find x and the value of each side.

d) The length of a rectangle is $(x + 5)$ cm and its width is x cm. Given that the perimeter of the rectangle is 26 cm, find the length and width of this rectangle.

e) A student spent 50 minutes doing her homework. She spent m minutes doing Geography, 2m minutes doing Mathematics and the remaining $(m + 7)$ minutes studying History. How many minutes did she spend doing Mathematics?

f) A woman at the market was selling apples and grapes. Each apple costs ■30 and each bunch of grapes costs ■120. She has twice as many apples as bunches of grapes. She sells all the fruit and receives ■2 800. How many apples did she have?

g) Omoyemwen has typed 28 more pages than Nsedu. Together they have typed a total of 276 pages. How many pages have each of them typed?

Q-3 **Without solving any of the equations, formulate word problems for each equation.**

a) $x + 5 = 12$

b) $250 – 50 = x + 10$

c) $4m + 8 = 3m – 1$

d) $3u - 30 = u - 7$

e) $a \div 10 = 50$

f) $v \div 3 = 13$

Q-4 **Write down equations to solve the following word problems.**

a) Half of a number, plus a fifth of two less than the number, is four less than the number. What is the number?

b) I think of a number, subtract six, divide by five and get four. What was the number I thought of?

c) Half of a number added to it, is a third of that number and is eight less than the number. What is the number?

d) The product of two consecutive numbers is 210. What are these numbers?

e) The length of a rectangle exceeds its breadth by 2 cm. What are the dimensions, if the area is 195 cm^2?

f) If I had 15 beads less than what I have, I should have only a quarter as many as I have now. How many do I have now?

g) If two■thirds of a number is added to one■half of that number, the sum is 35. Find the number.

h) If one■third of a number is subtracted from three■fourths of that number, the difference is 15. What is the number?

i) If one■fourth of a number is subtracted from two■fifths of a number, the difference is 3. Find the number.

j) If one■third of an integer is added to one■half of the next consecutive integer, the sum is 13. What are the two integers?

k) A woman spent two■thirds of her monthly wages on her car and one quarter on food. If she spent ■5 500 altogether, how much does she earn in a month?

l) A man is 10 years older than his wife. If the man's wife is y years old, express the man's age in terms of y. Determine the value of y if the age of the wife is two■thirds of her husband's age.

Chapter-8 Term 2 Solve word problems using algebraic fractions

Q-1 **Rewrite the following using inequality signs.**

a) x is less than 4

b) y is more than 7

c) a is equal to or greater than –5

d) x is greater than 2, but less than or equal to 8

e) t is greater than or equal to –9

f) 5 is not more than x

g) value of x is greater than or equal to 14

h) value of x is at least 1

i) 2 is more than x

Q-2 **Write the following inequalities in words.**

a) $x < -3$

b) $x \geq 4$

c) $-3 < x < 5$

d) $x \leq 0$

e) $x < -1$

f) $x < 13$

g) $6 > x$

h) $x \leq -8$

i) $x \geq 12$

Q-3 **Graph the following inequalities.**

a) $x > -11$

b) $x \geq 1$

c) $x < 15$

d) $x \geq -27$

e) $x < -12$

f) $x \leq 3$

g) $a \geq -4$

h) $6 > p$

Q-4 **Write down the inequalities for the following graphs.**

a) …

b) …

c) …

d) …

e) …

f) …

g) …

h) …

Q-5 **Solve the following inequalities.**

a) $5 < 9x - 4$

b) $3x + 7 \leq -5$

c) $1 > x/7 - 9$

d) $7x + 20 \geq 6$

e) $3 < 2x - 11$

f) $1 \geq 4x + 9$

g) $5x - 1 < 4$

Q-6 **Solve these inequalities, giving the solution set in ■. Then express your solution on the number line.**

a) $-x \geq 5$

b) $2x/3 < -4$

c) $11x + 1 \leq 34$

d) $-3x + 10 < -5x - 4$

e) $2x - 5 > 7x - 15$

f) $-13 \geq 5x - 3$

Q-7 **The product of nine and x is greater than six more than the product of three and x.**

Q-8 **Six more than two times a certain number is less than the number increased by twenty. Find the numbers that satisfy this condition.**

Q-9 **Two consecutive even integers are such that their sum is greater than ninety■eight decreased by twice the larger. Find the smallest possible values for the integers.**

Q-10 **You are competing in a triathlon, a sports competition with three events. Last year, you finished in 120 minutes. The time for swimming was 27 minutes and for biking it was 55 minutes. What possible times can you post in the running event and still beat last year's finishing time?**

Q-11 **Dele wants to buy some books. A company charges ■3 500 per book, plus ■800 for shipping and handling on the entire order. If Dele wants to spend at most ■15 000, how many books can he buy?**

Q-12 **The perimeter of a square must be less than 160 cm. What is the maximum length of a side in cm?**

Chapter-9 Term 2 Linear inequalities

Q-1 **Consider the data set below.**

a) Arrange the data from lowest to highest.

b) Arrange the data from highest to lowest.

Q-2 **Over one year, the average monthly temperatures (°C) for a city were as follows:**

a) Arrange the data in descending order.

b) What was the lowest temperature?

c) During which month is the highest temperature found?

Q-3 **The number of members in 20 families are given below:**

a) Arrange the data in ascending order.

b) Prepare a frequency table of the data.

Q-4 **A school conducts a survey of Grade 5 students to identify what extracurricular activities they like to do. The results are listed in the tally table below.**

a) Which extracurricular activity is the most popular?

b) Which activity is the least popular among students?

c) How many students show an interest in clay work?

d) How many students show an interest in drawing?

e) How many students participated in this survey?

Q-5 **The table below shows the number of portions of fruit that students eat each day.**

a) How many students eat three portions of fruit each day?

b) How many portions of fruit do four students eat?

c) How many students answered the question?

d) How many students eat less than three portions of fruit each day?

Q-6 **Bunmi does a survey about favourite pets and records this data.**

a) Draw and complete a frequency table for the data set.

b) How many people prefer cats?

c) Which is the most frequently preferred animal?

d) How many people were questioned in this survey?

Q-7 **Segun does a survey about the types of books people like to read. He draws the frequency table below. Draw a pictogram of the information. Use a picture of a book, where one book represents two people.**

Q-8 **Nike drew this pictogram of the type of dessert her classmates bring to school.**

a) Which is the most popular dessert?

b) Which is the least popular dessert shown?

c) How many people brought yoghurt?

d) How many people brought sweets?

e) How many more people brought crisps than brought nothing?

f) How many more people brought sweets than brought fruit?

g) How many people did Nike ask in total?

Q-9 **Yemisi watches cars go past her school and notes their colour. She drew this frequency table. Draw a pictogram of the information. Use a picture of a car to represent four cars.**

Q-10 **The results of a census are shown below: • Number of children: 50 000 • Number of women: 40 000 • Number of men: 30 000 By choosing the appropriate key, draw a pictograph to show the above information.**

Q-11 **Complete the table below, given that ■ = 2 people.**

Q-12 **The table below shows the preferences in chocolate bars of 40 students. Draw a bar graph to represent this information. Show the chocolate on the horizontal axis and the frequency on the vertical axis.**

Q-13 **A JSS 2 class was asked how many pairs of shoes they each had at home. The results are shown below. Represent this information on a bar chart.**

Q-14 **Use the table below to draw a bar graph of the frequency of different colour cars.**

Q-15 **The bar graph on the next page shows the number of students in each level at a certain college.**

a) Your friend does not know how to read off a bar graph. Explain to your friend how to do it.

b) How many students are there in total?

c) Which class is the largest?

d) How many students are there in the Junior levels combined? And in the senior levels?

Q-16 **The following information shows how many viewers watched a certain Nollywood movie over a three months period:**

a) Construct a bar graph to show the information.

b) Which month had the highest number of viewers?

c) What percentage of the total viewers watched the movie in June?

d) Do you think the number of viewers will continue to increase? Give a reason for your answer.

Q-17 **Mr Oloyede is the JSS 2 head teacher at his school. The school hosts an annual dance. Students choose the dress code for the event. Mr Oloyede conducts a survey to determine the dress code for the 2013 event. The results are recorded in the frequency table below.**

a) Calculate the total number of learners who responded to the survey.

b) Calculate the percentage of the students who preferred casual wear as the dress code for the dance.

c) Which dress code is the least preferred by the students?

d) Draw a bar graph to represent the dress preferred by the girls.

Q-18 **The following table shows how many goals a football team scored in each match of a football season. Draw a bar graph representing the number of goals scored.**

Q-19 **The bar graph below contains data about how many oranges a woman sells at the market on each day for one week.**

a) On which day did she sell the most oranges?

b) How many oranges did she sell on Friday?

c) Calculate the total number of oranges.

Q-20 **A company does a survey to determine what brand of training shoes are most popular. They find the following. Construct a pie chart to illustrate the data set. Show all calculations.**

Q-21 **Here is a pie chart showing how pupils travel to school every day.**

a) Estimate what fraction travel by: i) car ii) walk iii) taxi?

b) Estimate what percentage travel by: i) bus ii) walk iii) taxi?

c) 70 pupils were used in this survey. Use your estimate to find how many pupils travel by: i) car ii) walking iii) taxi?

Q-22 **The table below shows the budget for a dance.**

a) What percentage of the total cost is used for music?

b) What is the cost of the invitations?

c) Draw a pie chart using the above information.

Q-23 **The pie chart below shows the number of students in a university and the faculties in which they are studying.**

a) What percentage of students are studying Engineering?

b) Calculate each of the angles for the sectors.

Q-24 **In the pie chart below, how many degrees represent the sector 'farmland'?**

Q-25 **A pie chart is drawn with sectors to represent the following percentages: 20%, 50%, 25% and 5%. What is the angle of the sector that represents 5%?**

Q-26 **Use the bar graph from Question 8 in Exercise 3 to draw a pie chart of the oranges sold per day.**

Q-27 **The pass grades in an examination are A, B and C. The pie chart below shows the percentage of grades scored by students of a particular school. If there are 350 students in the school, calculate:**

a) the number who failed

b) the sector angle for the pass grades

c) the number who passed with Grade A.

Q-28 **The table below shows the results for the Tour de France in 2005.**

a) How many cyclists were from the USA?

b) What was the slowest time recorded?

c) Who was in the lead for this part of the race?

Q-29 **Gbenga used young sales people to demonstrate a new computer game at four different positions in a shop. Two hundred pamphlets were distributed. The table below shows how many shoppers just took a pamphlet about the game, and how many actually watched the demonstration of the game.**

a) Use the information in the table to determine the missing numbers A and B.

b) What percentage of people only took a pamphlet?

c) Do you think Gbenga's promotion was successful? Give a reason for your answer.

Q-30 **Learners were invited to enter a national essay-writing competition. A survey was done to find out how many winners came from each city. The results are given in the table on the right.**

a) Which city had the most winners?

b) Which cities had the same number of winners?

c) What percentage of the winners came from Port Harcourt?

Q-31 **On a particular day, Soji and his friends travelled a distance of 360 km. The table shows the time taken to travel the 360 km at different speeds. Determine the values of A and B. Use the formula: time = distance ÷ speed.**

Q-32 **The table alongside shows the inflation rate in Nigeria and the projected rate for 2015 to 2018.**

a) What was the inflation rate in 2013?

b) By how much will the inflation rate increase from 2015 to 2016?

c) If 1 ■ of milk cost ■360 in 2013, what will it cost in 2014?

Q-33 **The chart below shows the distances between certain Nigerian towns and cities.**

a) What is the distance between Port Harcourt and Akure?

b) What is the distance between Makurdi and Zaria?

c) Shalewa wants to travel from Benin City to Makurdi and from there to Kaduna. What is the total distance she will have to travel?

Q-34 **The bus schedule for travel from Abuja is shown below.**

a) At what time does the bus leave for Lagos?

b) How much will a bus ticket from Abuja to Lagos cost?

c) If you want to travel from Abuja to Onitsha, can you leave at 7 p.m.? Give a reason for your answer.

d) What type of bus will you use, if you are travelling to Awka?

e) What will a return ticket from Abuja to Awka cost?

Q-35 **The map on the next page shows the bus routes in and around Lagos.**

a) If you wanted to travel to Dona Ana, which route would you use?

b) Which method of transport is the quickest to get to Meia Praia?

c) Which terminus will you need to use if you want to travel on Routes 3, 5 and 9?

d) You need to go to the Health Centre. Describe the route and method of transport you will use.

e) What structure connects the bus station to the railway station?

f) You urgently need to visit your sick aunt in Montes Juntos. Give a reason why it might not be possible for you to make the journey.

Q-36 **Dayo and Dotun work for a courier company that offers an overnight service. This means they promise to deliver the items at the destination by 8 o'clock in the morning. They both travel from Benin City to Lagos in two different delivery vans of the same model and engine capacity to deliver packages. The table below shows the distance travelled by each over time. Use the table to answer the following questions.**

a) Did the two vans leave the starting point at the same time? Give a reason for your answer

b) At what time(s) were the two delivery vans 40 km apart?

c) Calculate the average speed of each driver at 04:00. Use the formula speed = distance ÷ time.

Q-37 **On 26 December 2004, many of the coastal towns bordering the Indian Ocean were devastated by a tsunami wave. The chart shows the height of a typical tsunami wave.**

a) What is the height of the wave?

b) What is the difference in height between a human and the wave?

c) What is the difference in height between the wave and a house?

d) How much taller is an elephant than a man?

Chapter-10 Term 2 Graphs

Q-1 **Use squared paper or graph paper to plot and label the following points.**

a) A(–1; 1), B(0; 3), C(2; 3), D(3; 2)

b) P(–2; 3), Q(–2; –2), R(2; –3)

Q-2 **Name the quadrant in which each of these ordered pairs is located.**

a) (–3; 7)

b) (10; 32)

c) (0; 7)

d) (–5; –2)

e) (2; –6)

Q-3 **Write down which point (A, M, and so on) is given by each of the ordered pairs below.**

a) (1; 3)

b) (–4; 0)

c) (–1; 1)

d) (4; –2)

e) (2; –3)

f) (3; 1)

g) (4; 4)

h) (0; –4)

i) (–3; 3)

j) (–4; –3)

Q-4 **Write down the ordered pair for each point given on the axis below.**

Diagram 1

Q-5 **Connect each sequence of points with a line. Identify the shape.**

a) (3; 3), (3; –2), (–2; –2)

b) (–2; 1), (1; 1), (4; –2), (–5; –2)

Q-6 **Plot and join the points in the given order. Complete the picture by joining the end points. Identify the mystery picture.**

a) (–8; 1), (–8; 2), (–6; 2), (–7; 5), (–6; 5), (–4; 2), (1; 1), (2; 5), (3; 4), (3; 1), (8; –1), (9; –3), (7; –4), (4; –3), (1; –2), (–4; –4), (–5; –3), (–1; –1), (–3; 0), (–5; 1)

b) (–4; 6), (2; 6), (2; 5), (–3; 5), (–3; 2), (1; 2), (1; 1), (–3; 1), (–3; –2), (2; –2), (2; –3), (–4; –3), (–4; 6)

Q-7 **Convert each of the following equations to standard form.**

a) $2y = 6x + 4$

b) $3y – x – 3 = 0$

c) $3x – y = –2$

Q-8 **Use a table like the one below to draw a graph for each equation in (a)–(f).**

a) $y = x$

b) $y = 2x – 1$

c) $y = –x + 3$

d) $y = 3$

e) $x = –2$

Q-9 **The following table shows the linear relationship between x and y. Determine the equation of the line passing through the points given.**

Q-10 **The standard form of a straight-line graph is y = m x + c.**

a) What does m represent?

b) What does c represent?

c) For each of the following, write down the value of m and c: i) $y = 2x + 2$ ii) $y = -x - 9$ iii) $y = 3x - 9$ iv) $y = 4$ v) $x = -2$

Q-11 **State the values of m and c in the following equations.**

a) $y = 3x - 2$

b) $2y = x + 1$

c) $2x + y = 3$

Q-12 **In each of the following state the value of the gradient and the direction in which the line will slope.**

a) $y = 2x + 1$

b) $y = -x + 2$

c) $y = 3x - 1$

d) $y = \frac{1}{2} x + 5$

e) $y = 5x - 4$

Q-13 **Write down the slope of each line and label the slope (gradient) m.**

a) $y = 7$ m = …

b) $x = -6$ m = …

c) $y = -30$ m = …

d) $x = 30$ m = …

e) the y-axis m = …

f) the x-axis m = …

Q-14 **Given the two equations $y = -3x + 3$; $y = -3x - 3$, draw the graphs of these equations on the same set of axes, clearly showing all intercepts.**

Q-15 **For the lines represented by the equations below, state the y-intercept and the x-intercept.**

a) $y - 2x = 4$

b) $3x + y = 6$

c) $x + 2y = 0$

d) $2x + 3y = 12$

e) $y = 0$

f) $x = 2$

g) $y = mx + c$

Chapter-11 Term 2 Plane figures and shapes

Q-1 **Have a ruler and a pair of scissors handy for this exercise. Your teacher will give you an enlarged copy of the quadrilaterals below.**

a) Cut out the shapes neatly.

b) Investigate the unique properties of each figure, by comparing them and by measuring the angles, the sides and the diagonals.

c) Complete the table of properties on the next page by placing ticks in the correct blocks.

Q-2 **Study the shapes below.**

a) a rhombus

b) a trapezoid

c) a shape that is a parallelogram and a rectangle

d) a shape that is a square and a parallelogram

Q-3 **On a piece of dot paper, draw five different parallelograms. Explain why each parallelogram is different.**

Q-4 **You are given the following attributes of quadrilaterals: two pairs of opposite sides are equal; two pairs of opposite angles are equal; the diagonals bisect each other. Use dotted paper to sketch and name as many quadrilaterals as you can, that have each attribute.**

Q-5 **From the box below find the best name used to describe each of the following shapes.**

a) …

b) …

c) …

d) …

e) …

Q-6 **Name the quadrilateral that fits the description below.**

a) A quadrilateral with two pairs of adjacent sides equal

b) A quadrilateral with diagonals of equal length

c) A quadrilateral where the diagonals bisect at 90°

d) A quadrilateral where only one diagonal is bisected

e) A quadrilateral where the diagonals bisect both opposite angles

f) A quadrilateral with two pairs of opposite sides parallel

g) A quadrilateral with two pairs of opposite sides equal

h) A quadrilateral where all the sides are equal

Q-7 **Is a trapezium a parallelogram? Give a reason for your answer.**

Q-8 **Consider the shape below.**

a) What quadrilateral is shown in the picture?

b) One of the properties of the shape is shown in the picture. Name all the other properties of this shape.

c) If the angles of the rhombus were 90°, what is the name of this shape?

d) What can you say about the diagonals of the shape named in (c)?

Q-9 **Say whether the following statements are true or false.**

a) The diagonals of a rectangle are equal and they bisect each other.

b) The diagonals of a kite bisect at 90°.

c) In a parallelogram where all the sides are equal, the angles are also all equal.

d) The diagonals of a rhombus are all equal and they bisect each other.

e) A parallelogram where all the angles are 90° and the diagonals are equal, can only be a rectangle.

Q-10 **Use the properties of the quadrilaterals to find x in the following.**

a) PQRS is a rectangle.

b) TVYZ is a trapezium.

c) PQRS is a rhombus.

d) ABCD is a kite. Find x and y.

Q-11 **Complete the table below by giving your own example of each of the shapes in everyday life.**

Trapezium

Kite

Parallelogram

Square

Rectangle

Q-12 **The picture below shows a traditional Navaho Indian design. Name all the shapes that you can see in the design.**

Q-13 **Design your own quilt by colouring in the template below. Your teacher will provide you with a copy of the template. Your quilt has to include:**

a) Either two isosceles trapeziums or a polygon with more than four sides

b) Parallelogram

c) Square or rhombus

d) Rectangle

Q-14 **The drawing below is the design for a carpet. Choose, from the labelled shapes in the design, the following:**

a) a square: F

b) a trapezium: B

c) a kite: A

d) a parallelogram that is not a rectangle or a rhombus: C

e) a rhombus, of which the diagonals are not equal: E

Q-15 **The diagram below is a scale drawing of a butterfly. What is the size of the butterfly's wingspan in real life?**

Q-16 **Find the length of the following objects and the scale factor:**

a) 0.5 cm = 1.5 m

b) 5 cm = 5 m

Q-17 **A house plan is drawn using a scale of 1 : 75.**

a) If the front door measures 2.4 cm on the plan, how tall is the door in reality?

b) The plot of land on which the house will be built is 24 m wide. What is the corresponding length on the plan?

Q-18 **A man has a plan for his new house drawn to a scale of 1 : 50. He draws the simplified diagram below with the measurements taken from the scale plan. Calculate, in metres, the height of the roof.**

Q-19 **Given that the scale of a map is 1 : 100 000, what will a length of 450 cm on the map represent in:**

a) cm?

b) m?

c) km?

Q-20 **The scale of a map is 1 : 20 000. What area does 16 cm² represent?**

Q-21 **The floor plan of a first-floor addition to Okwute and Olabisi's house is shown below.**

a) How many doors are shown on this plan?

b) The measurements of the bathroom is 2 cm by 2 cm. Calculate actual measurements in m.

c) Okwute and Olabisi are going to place a bed (1.8 m long by 1.8 m wide) in Bedroom 1, below the window. Make a scale drawing of the bed.

Q-22 **Ms Dbia has the following floor plan for a new house that she wants to have built. The outer dimensions of Bedroom 2 are 3.45 m × 3.45 m. Measure the dimensions of Bedroom 2 on the plan and determine the scale used.**

a) Measure the dimensions of Bedroom 2 on the plan.

b) Determine the scale used.

Q-23 **Use a scale of 1 : 100 to draw scale drawings of the heights and lengths of the following animals.**

TABLE

Q-24 **Hassana goes to Egypt and sees a model of a triangular pyramid. The dimensions of the model is shown below. She enlarges it using a scale factor of 1 : 2. Make a scale drawing of the enlarged shape, showing all measurements.**

DIAGRAM

Q-25 **Adaoma walks from home to church. The distance is 750 m. She turns right and walks to school that is 450 m away. After school, she turns 90° and walks 600 m back home. Make a scale drawing of her journey. Use a scale of 1 : 10 000.**

Q-26 **Measure, to an appropriate degree of accuracy, all relevant lengths, and then choose a suitable scale, and draw plans for the following:**

a) your classroom

b) your bedroom

c) the playground

Q-27 **Draw a scale diagram of a room, with a width of 20 cm and length of 25 cm. Make scale drawings of the furniture shown in the table below, and place them in the room.**

Q-28 **Your school is staging a concert and asks you to design the décor for the stage. The stage is 12 m by 8 m. Make a scale drawing of the stage using a scale of 1 : 200.**

Q-29 **Complete the table below.**

Q-30 **The distance on a map between a farm and the nearest town is 55 mm. The scale on the map is 1 : 22 500. Use the scale to calculate the actual distance in kilometres. (1 km = 1 000 000 mm.)**

Q-31 **A distance between two points on a map is 3 cm. The actual distance between the two points is 15 km. Determine the scale used on the map.**

Q-32 **Use the map below to answer the following questions. The scale on the map is 2.5 cm to 200 km.**

a) What is the distance, in km, from Benin City to Abuja?

b) Osarogie drives from Benin City to Abuja at an average speed of 110 km/h. How long will the journey take? Use the formula time = distance / speed.

c) Osarogie's car uses 11 ■ of petrol per 100 km. How much fuel does she need for the journey?

Q-33 **The map below shows the Trans-African highway from Lagos to Mombasa.**

a) After leaving Lagos, what will the first country be that you enter, if travelling along the highway?

b) The entire length of the highway is 6 259 km. If the scale on the map is 1 : 50 000 000, what will the measurement of the highway be on the map in cm?

Q-34 **Mfoniso is a Nigerian medical student on an exchange programme to South Africa. He is based at the Polokwane Hospital, but will also spend time at the Pietersburg Medi-Clinic. Use the map on the next page of the centre of Polokwane in Limpopo to answer the following questions.**

a) The Pietersburg Medi-Clinic takes up a whole block. Write down the names of the streets around the Medi-Clinic (with its entrance in Hospital Street), to the Pietersburg Medi-Clinic (with its entrance in Burger Street).

b) Give Mfoniso directions to travel from Polokwane Hospital (with its entrance in Hospital Street), to the Pietersburg Medi-Clinic (with its entrance in Burger Street).

c) On the map, the distance between the Polokwane Hospital and the Pietersburg Medi-Clinic is 50 mm. The scale is 1 : 40 500. Use the scale to give Mfoniso this distance in kilometres.

Chapter-12 Term 3 Real-life applications of linear graphs

Q-1 **Draw a graph for a range from 0 to 100 miles to convert miles to kilometres, given that 1 m = 1.60 km. Draw the miles-axis horizontally and calibrate it from 0 to 100 m, and draw the km-axis vertically, calibrated from 0 to 160. Use 2 cm to represent 20 units. Use your graph to find:**

a) how many km are equivalent to 70 m

b) how many m are equivalent to 100 km

Q-2 **Draw a graph to convert temperatures from the Celsius scale (°C) to the Fahrenheit scale (°F). Draw the °C-axis horizontally and label it from 0 to 100, using a scale of 2 cm to represent 20 units. Draw the °F-axis vertically and label it from 0 to 220, using a scale of 2 cm to represent 20 units. When the temperature is 0 °C, it is 32 °F, so plot a point at (0; 32). This is the temperature at which water freezes. When the temperature is 100 °C, it is 212 °F, so plot a point at (100; 212). This is the temperature at which water boils. Join these two points with a straight line. Use your graph to find the temperature in:**

a) °F when it is 20 °C, 65 °C and 95 °C

b) °C when it is 200 °F, 195 °F and 98.4 °F

Q-3 **Construct a conversion graph for changing marks in a test out of 60 to percentages. Use your graph to find:**

a) what percentages are equivalent to the marks 45, 39 and 20 out of 60?

b) what marks out of 60 give the percentages 64, 80 and 20?

Q-4 **Suppose the exchange rate between ■ and the South African rand (R) is ■14 = R1.**

a) Complete the table below.

b) Draw a graph to convert between ■ and rands.

c) Use the graph to find out the value of R60 in ■.

d) How much is ■550 in rands?

Q-5 **Ayanti started walking from home at 9:00 a.m. Her home is a distance of 3 km from the library. The graph below shows her journey.**

a) Calculate her walking speed.

b) What distance had she travelled at 11:00 a.m.?

c) What does the straight-line graph tell us about her walking speed?

d) Write the equation of this line in the form d = mt + c, where d is the distance, m is Ayanti's speed of walking, and c is the intercept on the distance axis.

e) What does m represent on this graph? Relate this to the general form of the gradient of a line, $\Delta y/\Delta x$.

Q-6 **Graphs (i) and (ii) show the distance–time graphs of two journeys.**

a) Which of these graphs represents an impossible situation? Explain your answer.

b) Describe what is happening in the other graph.

Q-7 **The graph below shows the journeys of two children, Chimezie and Tayo. They leave their homes at different times and travel 6 km to a supermarket to buy their school supplies. Chimezie walks and the line PQRS shows his journey. Tayo rides her bicycle and the line AS shows her journey. Answer the following questions from the graph:**

a) At what times did Chimezie and Tayo leave home?

b) How long did it take Chimezie to walk the part PQ of the journey?

c) When did Chimezie stop to rest?

d) During part RS, how far did Chimezie walk?

e) How far was Chimezie from Tayo at 10:45 a.m. and where was Tayo at this time?

f) At what time did Tayo arrive at the supermarket and what was her speed for the journey as shown by the line AS?

g) How far apart were the children at 11:15 a.m.?

Q-8 **A cyclist cycles at 18 km/h from Points A to B, a distance of 108 km.**

a) If he leaves Point A at 9 a.m., what time will he reach Point B, assuming he does not stop on the way?

b) How far will the cyclist be from Point A at: i) 10 a.m.; ii) 11 a.m.; iii) 12 p.m.; iv) 1 p.m.

c) Meanwhile a car leaves Point A at 12 p.m. and travels towards Point B at 45 km/h. Represent the cyclist's and the car's journeys as graphs on the same axes.

d) What can you say about the point where the two lines meet?

Q-9 **This graph shows the velocity of an airplane in km/min. Answer the questions using the graph.**

a) How long did it take the airplane to reach a velocity of 10 km/min?

b) How long did it take the airplane to reach the maximum velocity?

c) Is the velocity increasing or decreasing at 18 minutes?

d) Calculate the distance travelled at the constant speed of 20 km/min.

e) Calculate the acceleration and deceleration in km/min.

f) Calculate the total distance travelled.

g) Calculate the average velocity for the whole journey.

Q-10 **Interpret this velocity–time graph.**

Q-11 **A train accelerates uniformly from rest and reaches a maximum velocity of 4 km/min in 2 minutes. It then maintains this velocity for 3 minutes and then takes another 3 minutes to come to rest. Draw a velocity–time graph of the train and use it to answer the following questions:**

a) How long did it take the train to reach a velocity of 3 km/min?

b) Calculate the distance the train travelled at the steady velocity of 4 km/min.

c) Find the distance travelled after decelerating from this steady velocity to come to rest in the last 3 minutes.

d) Calculate the total distance the train travelled.

Chapter-13 Term 3 Angles and polygons

Q-1 **Solve for the unknown angles.**

a)

b)

c)

d)

e)

Q-2 **Solve for the unknown angles.**

a)

b)

c)

d)

e)

Q-3 **Solve for the unknown variable(s) in each of the following.**

a)

b)

c)

d)

e)

Q-4 **Calculate the value of the unknown angles. Give reasons for your answers.**

a)

b)

c)

d)

e)

Q-5 **Find the unknown angle in each of the following.**

a)

b)

c)

d)

e)

Q-6 **Complete the following table.**

a)

Q-7 **Find the missing angle.**

a)

b)

c)

d)

e)

Q-8 **Solve for x in each of the following.**

a)

b)

c)

d)

e)

Q-9 **Each interior angle of a regular polygon is 160°. How many sides does the polygon have?**

Q-10 **Calculate the size of each interior angle of a regular heptagon.**

Q-11 **A polygon is divided into seven triangles by drawing diagonals from one vertex.**

a) How many sides does the polygon have?

b) What is the size of its interior angles?

Q-12 **A hexagon has three equal angles. The other three angles are 115°, 85° and 130°. What is the size of each of the three equal angles?**

Q-13 **The figure below is a regular pentagon with centre O. Angle CÔD is called a central angle.**

a) Sketch the other central angles, by connecting Point O to each vertex of the polygon. How many central angles does a pentagon have?

b) Since all the central angles have a common vertex (Point O), what is the measure of one central angle?

c) What is the sum of the interior angles of pentagon ABCDE?

Q-14 **As the number of sides of a regular polygon increases, what happens to:**

a) the sum of the interior angles?

b) the measure of one central angle?

c) the measure of each interior angle?

Q-15 **ABCDE is a regular pentagon. Calculate x.**

Q-16 **The diagram shows a regular hexagon and a regular octagon. Calculate the size of the angle marked x.**

Q-17 **Find the values of x, y and z in the following diagrams.**

a)

b)

c)

d)

e)

Q-18 **The length of a rectangular plot of land is 24 m. The distance between the opposite corners of the plot is 30 m. Calculate the breadth of the plot.**

Q-19 **Calculate the length of the longest straight line which can be drawn on a rectangular white board which measures 2.5 m by 1.3 m.**

Q-20 **A pole is tied to the ground by a rope as shown on the right-hand side. The rope is attached to the pole, 6 m above the ground, and at a point on the ground, 3.5 m from the foot of the pole. Calculate the length of the rope.**

Q-21 **Give five examples of your own, of objects with horizontal and vertical surfaces.**

Q-22 **Classify each of the three angles in the figure below as an angle of elevation, an angle of depression, or neither.**

Q-23 **Show the angle of elevation and depression in each of the following.**

a)

b)

Q-24 **A 5 m ladder rests against a tree on level ground and forms a 75° angle of elevation. Draw a diagram of the situation, indicating clearly the horizontal, the vertical and the angle of elevation.**

Q-25 **A pilot travels at a height of 11 000 m above level ground. According to her GPS, she is 65 km away from the airport runway, as measured along the ground.**

a) Draw a diagram of the situation.

b) Indicate the angle of depression at which the pilot is looking down at the runway.

c) Indicate the angle of elevation of someone standing on the runway, looking up at the plane.

Q-26 **A dog, that is 8 m from the base of a tree, spots a squirrel in the tree at an angle of elevation of 40°. How tall is the tree?**

Q-27 **A ship is on the surface of the water, and its radar detects a submarine at a distance of 72 m, at an angle of depression of 23°. At what depth below the surface of the water is the submarine?**

Q-28 **Nagodeallah is 1.6 m tall and she is standing 10 m from a flagpole. If the angle of elevation is 25°, what is the height of the flagpole?**

Q-29 **The diagram below shows a tower. From two points, 25 m apart, the angles of elevation to the top of the tower are 35° and 60°. Calculate the height of the building by using a scale drawing.**

Q-30 **A man is standing 45 m away from a house. If the angle of elevation is 15°, what is the height of the house? Use a scale of 1 cm to 5 m to construct a scale drawing.**

Q-31 **Two observers are looking up at the top of the same tree from two different points on the ground. The first observer, who is 25 m away from the base of the tree, looks up at an angle of elevation of 58°. The second observer is standing 15 m from the base of the tree. (Note: You may ignore the heights of the observers and assume their measurements are made directly from the ground.)**

a) How tall is the tree, to the nearest metre? Use a scale drawing.

b) At what angle of elevation must the second observer look up to see the top of the tree?

Chapter-14 Term 3 Bearing

Q-1 **What angle do you turn through, if you turn clockwise from the following directions?**

a) N to S

b) E to W

c) N to NE

d) N to SW

e) W to NW

Q-2 **Draw an accurate diagram for each of the following bearings.**

a) An aircraft flying on a bearing of 075°.

b) A submarine travelling on a bearing of 150°.

c) A rocket travelling on a bearing of 200°.

d) A car travelling on a bearing of 048°.

e) A helicopter flying on a bearing of 310°.

Q-3 **Write down the three■figure bearing for each of the following.**

a)

b)

c)

Q-4 **The following diagrams show journeys from A to B. Calculate the bearing of the return journey from B to A.**

a)

b)

c)

Q-5 **Below are the bearings of an airplane to different destinations. Draw diagrams and find the bearings of the airplane's return journey after it has reached its destination. Use Point A for the airport and Point B for the destination.**

a) 056°

b) 132°

c) 212°

d) 302°

Q-6 **The diagram shows three places, A, B and C. Find the bearing of the following:**

a) A from C

b) B from A

c) C from B

d) B from C

Q-7 **Study the map on the right.**

a) In what compass direction do you travel from Blue City to Green City?

b) What is the bearing to travel from Green City to Red City?

Q-8 **A ship sets sail on a bearing of 055°. It then turns through an angle of 90° anticlockwise. Use a diagram to determine the new bearing.**

Q-9 **Consider the map of a village below. Find the following bearings:**

a) The bearing from the houses to the ancestors' graves.

b) The bearing from the school to the chief's compound.

c) The bearing from the market to the stone outcropping.

Q-10 **A pirate's treasure is buried on an island. The treasure is located on a bearing of 065° from the Palms of Peril (Point A) and a bearing of 285° from the Mountains of Doom (Point B).**

a) Use the diagram below to help a treasure hunter locate the treasure. Mark the spot with an X.

b) After collecting the treasure the treasure hunter wants to get back to his ship. He sets out at a bearing of 260° from the treasure's location. Is this a good idea? Give a reason for your answer.

c) Help the treasure hunter get back to his ship (Point D) by way of the river and the bridge (Point C). Provide all bearings for the route.

Q-11 **There are two coastguard stations, A and B, sited on small islands. B is due east of A. Given below are the bearings of sightings of ships from both stations. Use scale drawings to complete the table below.**

a) 1 cm : 1 km 8 km 080° 010°

b) 1 cm : 1 km 6 km 100° 130°

c) 1 cm : 1 km 9 km 125° 170°

Q-12 **A person walks on a bearing of 120° for 5 km. They then walk on a bearing of 040° for 3 km. How far, in a straight line, is the person from their starting point?**

Q-13 **A helicopter takes off and flies on a bearing of 075° for 45 km. It then flies on a bearing of 080° for 60 km, after which, the helicopter flies on a bearing of 300° for 70 km. Draw an accurate scale drawing of the helicopter's journey and use it to answer the following questions:**

a) Using a scale of 1 cm = 10 km, draw an accurate scale drawing of the helicopter's journey.

b) What distance did the helicopter travel?

c) At the end of its journey, how far is the helicopter from the start?

Q-14 **Cross country runners run on a bearing of 055° for 4 km. The runners then change direction and run the next 6 km on a bearing of 100°. How far, in a straight line, are the runners from the starting point?**

Q-15 **A submarine leaves port on a bearing of 220° for 80 km. It then travels on a bearing of 100° for 60 km. On what bearing, and how far should the submarine travel to return to its port? Use a scale drawing to help you answer the question.**

Q-16 **A hot air balloon is blown 5 km NW. The wind then changes direction, and the balloon is blown a further 6 km on a bearing of 300° before landing. How far is the balloon from its starting point when it lands?**

Q-17 **Three airplanes take off from Airport A, each one flying on a different bearing to another airport. The bearings and distances from Airport A to these airports are given in the table below. Using a scale of 1 cm to represent 50 km, draw a map showing the positions of the four airports.**

Q-18 **A yacht heads out onto a lake from the jetty on a bearing of 235° for 1 550 m and then on a bearing of 070° for 2 100 m.**

a) Using a scale of 1 cm : 250 m, construct this scale drawing.

b) Use this scale drawing to find: i) the bearing on which the yacht has to head to return to the jetty; ii) the actual distance the yacht is from the jetty.

Chapter-15 Term 3 Constructions

Q-1 **Construct the bisector of X■.**

Q-2 **Construct an equilateral triangle with all sides of length 7 cm.**

Q-3 **Construct the triangle below. Measure the other two sides and the third angle.**

Q-4 **Use a ruler and protractor to construct ■PQR with PQ = 8 cm, PR = 7 cm and QP■R = 42°.**

Q-5 **Use a ruler and protractor to construct ■ABC with AB = 8 cm, BC = 9 cm and AC = 6 cm.**

a) Measure the sizes of all the angles.

b) What do you notice about the sum of the angles?

c) Find the perimeter of ■ABC in cm.

Q-6 **Construct a right-angled ■ABC, such that ■ = 90° and CB = 9 cm and AB is 15 cm. Measure the length of the other side.**

Q-7 **Construct ■ABC, such that BÂC = 43°, B■A = 56° and AC = 6.4 cm. What type of triangle is ■ABC?**

Q-8 **Construct ■MNO, such that NM■O and NÔM both 50° and OM = 8 cm.**

a) What type of triangle did you construct?

b) What do you notice about the angles and sides?

Q-9 **Construct ■HIJ, such that HI = 4.8 cm, IJ = 7.3 cm and HÎJ = 52°.**

a) Measure the other angles.

b) Construct the angle bisector of HÎJ.

Q-10 **Bisect ■ and extend the bisector to go through XZ. Bisect X■ and extend the bisector to go through YZ. What do you notice?**

Chapter-16 Term 3 Data presentation

Q-1 **"Flip a coin" Prediction for most frequent outcome: Heads/Tails**

Q-2 **"Roll 1 die" Prediction for most frequent outcome: 1 2 3 4 5 6**

Q-3 **"Pick a card colour" Prediction for most frequent outcome: Red/Black**

Q-4 **"Pick a card suit" Prediction for most frequent outcome: Clubs (♣)/Spades (♠)/Diamonds (♦)/Hearts (♥)**

Q-5 **"Pick an exact card"**

Q-6 **In which game of chance were your predictions most accurate?**

Q-7 **Complete the table below, writing down the probability for each event. Use the results from your experiments in Questions 1 to 5 to calculate the experimental probabilities.**

Q-8 **Compare the theoretical and experimental probabilities for each game of chance. Were the theoretical and experimental probabilities in your experiments close to each other?**

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c) What is the probability of choosing a prime number?

d) What is the probability of choosing 1 or 5?

e) What is the probability of choosing 3 or 4?

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a) What is the probability of choosing red?

b) What is the probability of choosing green?

c) What is the probability of choosing either red or white?

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e) What is the probability of choosing other than yellow?

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Q-11 **Identify more likely, less likely, equally likely, sure and impossible events.**

a) Selecting of a white ball from a box with 5 white balls, 8 red balls and 10 yellow balls.

b) Selecting of a black card from a deck of cards.

c) The chance of getting an even number when a die is rolled.

d) Selecting of a red marble from a box with 12 white marbles.

e) Selecting of a red marble from a box with 12 white balls.

f) Selecting a boy for a field trip from a group of 35 students, of which 12 are girls.

Q-12 **A month is chosen from a year.**

a) Find the probability of selecting a month with 31 days.

b) Find the probability of selecting a month ending with the letter Y.

c) Find the probability of selecting a month ending with the letter R.

d) Find the probability of choosing a month either starting with the letter J or ending with the letter Y.

e) Find the probability of selecting a month that starts with the letter J and ends with the letter Y.

Q-13 **A die, numbered 1 to 6, is rolled once. What is the probability that a 5 is gotten?**

Q-14 **A wardrobe contains 3 blue shirts and 4 white shirts. A shirt is selected at random from the wardrobe. Find the probability that a white shirt is selected.**

Q-15 **A box has 6 packets of chewing gum. A packet is selected at random from the box. Find the probability that it is a chocolate.**

Q-16 **The probability of an event happening is: Find the probability of the event failing to happen in each case.**

a) 3/4

b) 7/8

c) 12/17

d) 4/31

e) 17/19

Q-17 **A bag contains 11 green balls and 14 yellow balls. A ball is selected at random from the bag. Find the probability that it is:**

a) green

b) yellow

Q-18 **Mayowa has a bag containing 10 oranges and 7 apples. He selects a fruit at random from the bag. What is the chance of it being an apple?**

Q-19 **A number is selected at random from the set (1, 2, 3, 4, 5, 6, 7, 8, 9, 10). Find the probability that it is:**

a) odd

b) even

Q-20 **From the set of numbers 1 to 20, a number is selected. Find the probability that it is:**

a) odd

b) even

Q-21 **A letter is selected at random from the English alphabet. Find the probability that it is:**

a) a vowel

b) a consonant.

Q-22 **Construct the bisector of X■.**

Q-23 **Construct an equilateral triangle with all sides of length 7 cm.**

Q-24 **Construct the triangle below. Measure the other two sides and the third angle.**

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a) Arrange the data from lowest to highest.

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Q-33 **Over one year, the average monthly temperatures (°C) for a city were as follows:**

a) Arrange the data in descending order.

b) What was the lowest temperature?

c) During which month is the highest temperature found?

Q-34 **The number of members in 20 families are given below:**

a) Arrange the data in ascending order.

b) Prepare a frequency table of the data.

Q-35 **A school conducts a survey of Grade 5 students to identify what extracurricular activities they like to do. The results are listed in the tally table below.**

a) Which extracurricular activity is the most popular?

b) Which activity is the least popular among students?

c) How many students show an interest in clay work?

d) How many students show an interest in drawing?

e) How many students participated in this survey?

Q-36 **The table below shows the number of portions of fruit that students eat each day.**

a) How many students eat three portions of fruit each day?

b) How many portions of fruit do four students eat?

c) How many students answered the question?

d) How many students eat less than three portions of fruit each day?

Q-37 **Bunmi does a survey about favourite pets and records this data.**

a) Draw and complete a frequency table for the data set.

b) How many people prefer cats?

c) Which is the most frequently preferred animal?

d) How many people were questioned in this survey?

Q-38 **Segun does a survey about the types of books people like to read. He draws the frequency table below. Draw a pictogram of the information. Use a picture of a book, where one book represents two people.**

Q-39 **Nike drew this pictogram of the type of dessert her classmates bring to school.**

a) Which is the most popular dessert?

b) Which is the least popular dessert shown?

c) How many people brought yoghurt?

d) How many people brought sweets?

e) How many more people brought crisps than brought nothing?

f) How many more people brought sweets than brought fruit?

g) How many people did Nike ask in total?

Q-40 **Yemisi watches cars go past her school and notes their colour. She drew this frequency table. Draw a pictogram of the information. Use a picture of a car to represent four cars.**

Q-41 **The results of a census are shown below: • Number of children: 50 000 • Number of women: 40 000 • Number of men: 30 000 By choosing the appropriate key, draw a pictograph to show the above information.**

Q-42 **Complete the table below, given that ■ = 2 people.**

Q-43 **The table below shows the preferences in chocolate bars of 40 students. Draw a bar graph to represent this information. Show the chocolate on the horizontal axis and the frequency on the vertical axis.**

Q-44 **A JSS 2 class was asked how many pairs of shoes they each had at home. The results are shown below. Represent this information on a bar chart.**

Q-45 **Use the table below to draw a bar graph of the frequency of different colour cars.**

Q-46 **The bar graph on the next page shows the number of students in each level at a certain college.**

a) Your friend does not know how to read off a bar graph. Explain to your friend how to do it.

b) How many students are there in total?

c) Which class is the largest?

d) How many students are there in the Junior levels combined? And in the senior levels?

Q-47 **The following information shows how many viewers watched a certain Nollywood movie over a three months period:**

a) Construct a bar graph to show the information.

b) Which month had the highest number of viewers?

c) What percentage of the total viewers watched the movie in June?

d) Do you think the number of viewers will continue to increase? Give a reason for your answer.

Q-48 **Mr Oloyede is the JSS 2 head teacher at his school. The school hosts an annual dance. Students choose the dress code for the event. Mr Oloyede conducts a survey to determine the dress code for the 2013 event. The results are recorded in the frequency table below.**

a) Calculate the total number of learners who responded to the survey.

b) Calculate the percentage of the students who preferred casual wear as the dress code for the dance.

c) Which dress code is the least preferred by the students?

d) Draw a bar graph to represent the dress preferred by the girls.

Q-49 **The following table shows how many goals a football team scored in each match of a football season. Draw a bar graph representing the number of goals scored.**

Q-50 **The bar graph below contains data about how many oranges a woman sells at the market on each day for one week.**

a) On which day did she sell the most oranges?

b) How many oranges did she sell on Friday?

c) Calculate the total number of oranges.

Q-51 **A company does a survey to determine what brand of training shoes are most popular. They find the following. Construct a pie chart to illustrate the data set. Show all calculations.**

Q-52 **Here is a pie chart showing how pupils travel to school every day.**

a) Estimate what fraction travel by: i) car ii) walk iii) taxi?

b) Estimate what percentage travel by: i) bus ii) walk iii) taxi?

c) 70 pupils were used in this survey. Use your estimate to find how many pupils travel by: i) car ii) walking iii) taxi?

Q-53 **The table below shows the budget for a dance.**

a) What percentage of the total cost is used for music?

b) What is the cost of the invitations?

c) Draw a pie chart using the above information.

Q-54 **The pie chart below shows the number of students in a university and the faculties in which they are studying.**

a) What percentage of students are studying Engineering?

b) Calculate each of the angles for the sectors.

Q-55 **In the pie chart below, how many degrees represent the sector 'farmland'?**

Q-56 **A pie chart is drawn with sectors to represent the following percentages: 20%, 50%, 25% and 5%. What is the angle of the sector that represents 5%?**

Q-57 **Use the bar graph from Question 8 in Exercise 3 to draw a pie chart of the oranges sold per day.**

Q-58 **The pass grades in an examination are A, B and C. The pie chart below shows the percentage of grades scored by students of a particular school. If there are 350 students in the school, calculate:**

a) the number who failed

b) the sector angle for the pass grades

c) the number who passed with Grade A.

Q-59 **The table below shows the results for the Tour de France in 2005.**

a) How many cyclists were from the USA?

b) What was the slowest time recorded?

c) Who was in the lead for this part of the race?

Q-60 **Gbenga used young sales people to demonstrate a new computer game at four different positions in a shop. Two hundred pamphlets were distributed. The table below shows how many shoppers just took a pamphlet about the game, and how many actually watched the demonstration of the game.**

a) Use the information in the table to determine the missing numbers A and B.

b) What percentage of people only took a pamphlet?

c) Do you think Gbenga's promotion was successful? Give a reason for your answer.

Q-61 **Learners were invited to enter a national essay-writing competition. A survey was done to find out how many winners came from each city. The results are given in the table on the right.**

a) Which city had the most winners?

b) Which cities had the same number of winners?

c) What percentage of the winners came from Port Harcourt?

Q-62 **On a particular day, Soji and his friends travelled a distance of 360 km. The table shows the time taken to travel the 360 km at different speeds. Determine the values of A and B. Use the formula: time = distance ÷ speed.**

Q-63 **The table alongside shows the inflation rate in Nigeria and the projected rate for 2015 to 2018.**

a) What was the inflation rate in 2013?

b) By how much will the inflation rate increase from 2015 to 2016?

c) If 1 ■ of milk cost ■360 in 2013, what will it cost in 2014?

Q-64 **The chart below shows the distances between certain Nigerian towns and cities.**

a) What is the distance between Port Harcourt and Akure?

b) What is the distance between Makurdi and Zaria?

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Q-65 **The bus schedule for travel from Abuja is shown below.**

a) At what time does the bus leave for Lagos?

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Q-66 **The map on the next page shows the bus routes in and around Lagos.**

a) If you wanted to travel to Dona Ana, which route would you use?

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a) Did the two vans leave the starting point at the same time? Give a reason for your answer

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Q-68 **On 26 December 2004, many of the coastal towns bordering the Indian Ocean were devastated by a tsunami wave. The chart shows the height of a typical tsunami wave.**

a) What is the height of the wave?

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Chapter-17 Term 3 Probability

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Q-41 **"Pick a card suit" Prediction for most frequent outcome: Clubs (♣)/Spades (♠)/Diamonds (♦)/Hearts (♥)**

Q-42 **"Pick an exact card"**

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d) What is the probability of choosing 1 or 5?

e) What is the probability of choosing 3 or 4?

Q-47 **There are 5 white balls, 8 red balls, 7 yellow balls and 4 green balls in a container. A ball is chosen at random. Give all your answers as a fraction, a decimal and a percentage.**

a) What is the probability of choosing red?

b) What is the probability of choosing green?

c) What is the probability of choosing either red or white?

d) What is the probability of choosing neither white nor green?

e) What is the probability of choosing other than yellow?

f) What is the probability of choosing black?

Q-48 **Identify more likely, less likely, equally likely, sure and impossible events.**

a) Selecting of a white ball from a box with 5 white balls, 8 red balls and 10 yellow balls.

b) Selecting of a black card from a deck of cards.

c) The chance of getting an even number when a die is rolled.

d) Selecting of a red marble from a box with 12 white marbles.

e) Selecting of a red marble from a box with 12 white balls.

f) Selecting a boy for a field trip from a group of 35 students, of which 12 are girls.

Q-49 **A month is chosen from a year.**

a) Find the probability of selecting a month with 31 days.

b) Find the probability of selecting a month ending with the letter Y.

c) Find the probability of selecting a month ending with the letter R.

d) Find the probability of choosing a month either starting with the letter J or ending with the letter Y.

e) Find the probability of selecting a month that starts with the letter J and ends with the letter Y.

Q-50 **A die, numbered 1 to 6, is rolled once. What is the probability that a 5 is gotten?**

Q-51 **A wardrobe contains 3 blue shirts and 4 white shirts. A shirt is selected at random from the wardrobe. Find the probability that a white shirt is selected.**

Q-52 **A box has 6 packets of chewing gum. A packet is selected at random from the box. Find the probability that it is a chocolate.**

Q-53 **The probability of an event happening is: Find the probability of the event failing to happen in each case.**

a) 3/4

b) 7/8

c) 12/17

d) 4/31

e) 17/19

Q-54 **A bag contains 11 green balls and 14 yellow balls. A ball is selected at random from the bag. Find the probability that it is:**

a) green

b) yellow

Q-55 **Mayowa has a bag containing 10 oranges and 7 apples. He selects a fruit at random from the bag. What is the chance of it being an apple?**

Q-56 **A number is selected at random from the set (1, 2, 3, 4, 5, 6, 7, 8, 9, 10). Find the probability that it is:**

a) odd

b) even

Q-57 **From the set of numbers 1 to 20, a number is selected. Find the probability that it is:**

a) odd

b) even

Q-58 **A letter is selected at random from the English alphabet. Find the probability that it is:**

a) a vowel

b) a consonant.