

ASSESSMENT AT GRADE 8

TEST PAPER 1

NAME

SCHOOL NAME

CLASS/SECTION

MATHEMATICS

1 hour 45 mins

Students answer on the question paper.

READ THESE INSTRUCTIONS FIRST

Answer **all** questions.

Write your name, the name of your school and your class/section in the spaces provided above.

Write in dark blue or black ink.

You may use a soft pencil for any diagram or rough working.

Do not use correction fluid.

If working is needed for any question it must be shown in the space below that question.

Omission of essential working may result in loss of marks.

Diagrams are **not** drawn to scale.

ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is **100**.

TEST PAPER 1

1. Evaluate.

(a) $2\frac{1}{4} \times 1\frac{1}{3}$

(b) $5\frac{1}{4} - 2\frac{3}{5}$

(c) $\frac{3}{8} \div 12$

Answer (a) $\dots 3 \dots$ [1]
 (b) $\dots 2\frac{13}{20} \dots$ [1]
 (c) $\dots \frac{1}{32} \dots$ [1]

2. Evaluate.

(a) $-4 + 9$

(b) $9 \div (-3)$

(c) $5 + 2 \times 4$

Answer (a) $\dots 5 \dots$ [1]
 (b) $\dots -3 \dots$ [1]
 (c) $\dots 13 \dots$ [1]

3. Write down the value of each of the following.

(a) $\sqrt{81}$

(b) $\sqrt[3]{64}$

(c) $\sqrt{0.0144}$

Answer (a) $\dots 9 \dots$ [1]
 (b) $\dots 4 \dots$ [1]
 (c) $\dots 0.12 \dots$ [1]

4. (a) Express the ratio 63 : 105 in its simplest form.
 (b) A rope of length 180 cm is divided into 3 pieces in the ratio 5 : 4 : 3. Calculate the difference in the lengths between the longest and the shortest pieces.

Answer (a) $3:5$ [1]
 (b) 30 cm [1]

5. (a) Calculate 25 % of R 125 000.
 (b) Express 240 grams as a percentage of 1.2 kilograms.

Answer (a) Rs $31\,250$ [1]
 (b) 20 % [1]

6. Write down the next term in each of the following sequences.
 (a) 2, 5, 7, 12,
 (b) 1, 4, 9, 16,

Answer (a) 19 [1]
 (b) 25 [1]

7. (a) Express 0.72 as a fraction in its lowest terms.
 (b) Express $\frac{4}{125}$ as a decimal number.

Answer (a) $\frac{18}{25}$ [1]
 (b) 0.032 [1]

8. (a) Find the value of x such that $4 : 5 = x : 10$.

(b) Solve the equation $\frac{2}{x} = \frac{x}{32}$.

Answer (a) ... $x = 8$... [1]

(b) $x = 8$ or $x = -8$... [1]

9. (a) Write down all the integer values of x such that $-2 \leq x < 1$.

(b) Solve the inequality $5 - 2x \leq 12$.

Answer (a) ... $-2, -1, 0$... [1]

(b) ... $x \geq -3.5$... [1]

10. (a) Express 5.0238 correct to 3 decimal places.

(b) Evaluate $4.93 - 2.579$.

Answer (a) ... 5.024 ... [1]

(b) ... 2.351 ... [1]

11. Given that $\sqrt{5} = 2.236$ and $\sqrt{50} = 7.071$, find the value of

(a) $\sqrt{50000}$,

(b) $\sqrt{0.5}$.

Answer (a) ... 223.6 ... [1]

(b) ... 0.7071 ... [1]

12. (a) Find the L.C.M. of 90 and 126.
 (b) Find the H.C.F of $4xy^2z^3$ and $14x^3y^2z^2$.

Answer (a) ... 630 [1]
 (b) ... $2xy^2z^2$ [1]

13. Solve the following equations.

- (a) $3x - 5 = 10$
 (b) $2(4x + 5) = 5(x + 2)$
 (c) $\frac{x}{2} + \frac{x}{4} = 2$

Answer (a) ... $x = 5$ [2]
 (b) ... $x = 0$ [2]
 (c) ... $x = 2\frac{2}{3}$ [2]

14. Simplify the following expressions.

- (a) $7x + 2y - 4x + y$
 (b) $\frac{48x^3y}{16xy^2}$

Answer (a) ... $3x + 3y$ [2]
 (b) ... $\frac{3x^2}{y}$ [2]

15. Convert

- (a) 2.0195 kg into g,
- (b) $1\frac{2}{5}$ hours into minutes,
- (c) 1.2 hectares into m^2 .

Answer (a) ... 2019.5 g [2]
 (b) ... 84 minutes [2]
 (c) ... 12 000 m^2 [2]

16. Factorise completely.

- (a) $3x - 12$
- (b) $2y^2 + y$
- (c) $ax - ay - kx + ky$

Answer (a) ... $3(x-4)$ [2]
 (b) ... $y(2y+1)$ [2]
 (c) ... $(a-k)(x-y)$ [2]

17. Calculate the simple interest on an investment of Rs 400 000 for a period of 15 months at the rate of 4.5 % per annum.

Answer Rs ... 22 500 [2]

18. Given that $x = 5$, $y = 2$ and $z = -4$, evaluate

(a) $x - z$,

(b) yz^2 ,

(c) $\frac{xz}{y}$.

Answer (a) 9 [2]
 (b) 32 [2]
 (c) -10 [2]

19. (a) Find the sum of the interior angles of a pentagon.
 (b) Four of the interior angles of a pentagon are 105° each. Find the size of the fifth angle.

Answer (a) 540° [2]
 (b) 120° [2]

20. (a) The price of a shirt decreases from Rs 800 to Rs 500. Calculate the percentage decrease in the price.
 (b) In a clearance sale, all prices were reduced by 25%. During the sale, a table was sold for Rs 12 000. Calculate the reduction in the price of the table.

Answer (a) 37.5 % [2]
 (b) Rs. 4000 [2]

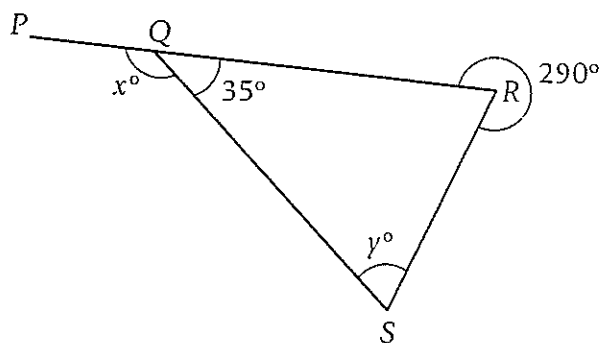
21. (a) A van travels a distance of 150 km at an average speed of 72 km/h. Calculate the time taken by the van. Give your answer in hours and minutes.
 (b) Convert 72 km/h into m/s.

Answer (a) ... 2 ... h . 05 . min [2]
 (b) 20 m/s [2]

22. In the diagram, PQR is a straight line. Angle $RQS = 35^\circ$ and the reflex angle QRS is 290° . Angle $PQS = x^\circ$ and angle $QSR = y^\circ$.

Calculate

- (a) x ,
 (b) y .

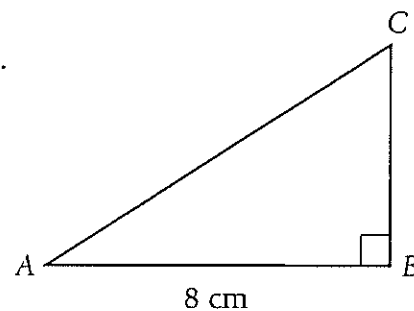


Answer (a) $x = \dots 145^\circ \dots$ [1]
 (b) $y = \dots 75^\circ \dots$ [2]

23. The diagram shows a right-angled triangle ABC .
 $AB = 8$ cm and the area of the triangle is 24 cm².

(a) Show that $BC = 6$ cm.

$$\begin{aligned} A &= \frac{1}{2} \times 8 \times h = 24 \\ 4h &= 24 \\ h &= \frac{24}{4} \\ &= 6 \end{aligned}$$



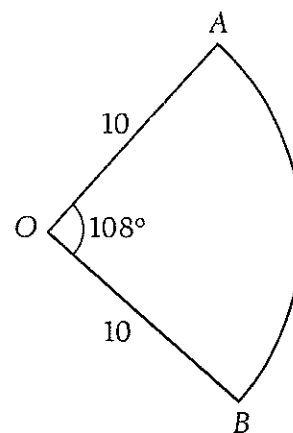
(b) Calculate the length of AC .

[2]

Answer (b) cm [3]

24. The diagram shows the sector of circle with centre O and radius 10 cm.
 Angle $AOB = 108^\circ$. Taking the value of π to be 3.14 , find

- (a) the length of the arc AB ,
 (b) the area of the sector OAB .



Answer (a) 18.84 cm [2]

(b) 94.2 cm² [2]

25. (a) Write down the equation of the straight line which passes through the points (5, 0), (5, 2) and (5, 4).

Answer (a) $x = 5$ [1]

- (b) Write down the coordinates of the point of intersection of the lines $y = 4$ and $x = 5$.

Answer (b) (5, 4) [1]

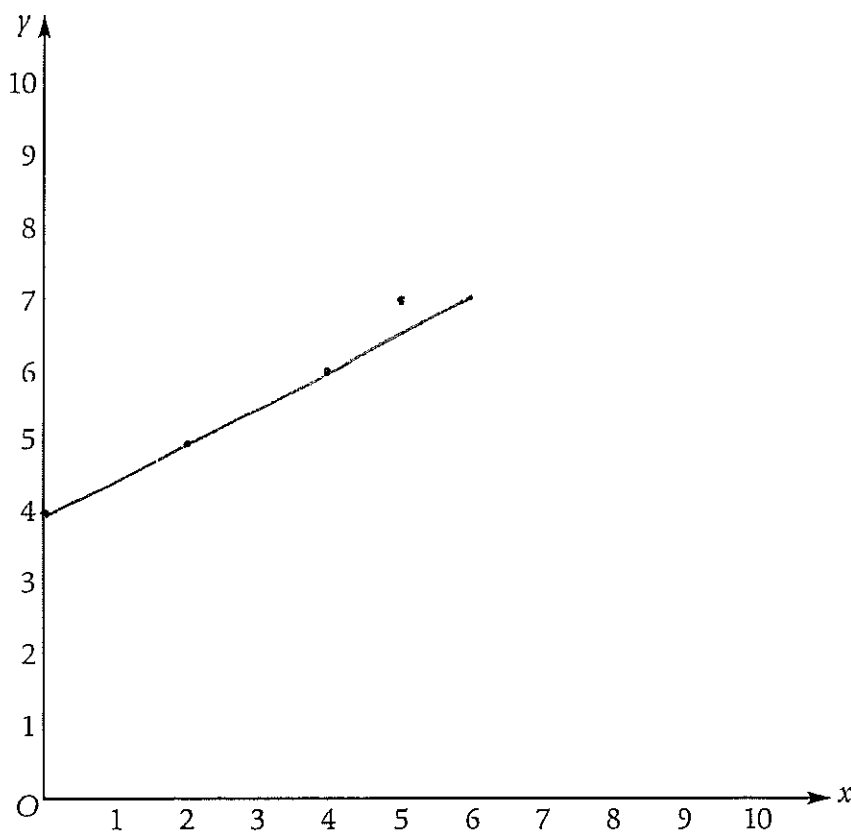
- (c) The equation of a straight line is $y = \frac{1}{2}x + 4$.

- (i) Complete the table below.

x	0	2	4	6
y	4	5	6	7
(x, y)	(0, 4)	(2, 5)	(4, 6)	(6, 7)

[2]

- (ii) On the grid provided below draw the line $y = \frac{1}{2}x + 4$.



[3]

TEST PAPER 2

1. Evaluate.

(a) $54 \div 0.3$

(b) $5.08 - 2.783$

(c) $(0.3)^2$

Answer (a) ... 180 [1]

(b) ... 2.297 [1]

(c) ... 0.09 [1]

2. Write down the missing term in each of the following sequences.

(a) 3,, 7, 11, 18, 29.

(b) (1, 3), (2, 5), (3, 7), (.)

Answer (a) ... 4 [1]

(b) (... 4 ... 9 ...) [1]

3. Evaluate.

(a) $\frac{3}{4} + 2\frac{1}{2}$

(b) $2\frac{1}{4} \times \frac{8}{9}$

(c) $12 \div \frac{9}{16}$

Answer (a) ... $3\frac{1}{4}$ [1]

(b) ... 2 [1]

(c) ... $21\frac{1}{3}$ [1]

4. Evaluate.

(a) 7^3

(b) $\sqrt{\frac{9}{16}}$

(c) $32^{\frac{1}{5}}$

Answer (a) ... ~~343~~ [1]

(b) ... $\frac{3}{4}$ [1]

(c) ... 2 [2]

5. Simplify.

(a) $5 - 2(1 - 2x)$

(b) $3x + 7y + 5x - 5y$

(c) $\frac{2x}{5} + \frac{x}{4}$

Answer (a) ... $3 + 4x$ [2]

(b) ... $8x + 2y$ [2]

(c) ... $\frac{13x}{20}$ [2]

6. (a) Decrease Rs 1 200 in the ratio 3 : 4.

(b) A rope is cut into two pieces in the ratio 3 : 5. If the length of the shorter piece is 72 cm, find the length of the longer piece.

Answer (a) Rs ... 900 [1]

(b) ... 120 cm [2]

7. Evaluate.

(a) $7^0 + 0^7$

(b) $92^2 - 88^2$

Answer (a) $\dots \frac{3}{4} \dots [1]$
 (b) $\dots 700 \dots [2]$

8. Given that $\sqrt{3.5} = 1.87$ and $\sqrt{35} = 5.92$, find

(a) $\sqrt{350}$,

(b) $\sqrt{0.35}$.

Answer (a) $\dots 18.7 \dots [2]$
 (b) $\dots 0.592 \dots [2]$

9. Factorise completely.

(a) $8x - 12$

(b) $5x^2 - 10x - kx + 2k$

Answer (a) $\dots 4(2x-3) \dots [1]$
 (b) $(x-2)(5x-k) \dots [2]$

10. (a) Express 0.02379 correct to 3 decimal places.
 (b) Find the decimal number which is exactly halfway between 0.48 and 0.62.

Answer (a) ... 0.024 [1]
 (b) ... 0.55 [2]

11. Simplify.

(a) $x^2 \times x^3$

(b) $(2x^2)^3$

(c) $\frac{12x^3y^4}{18xy^2}$

Answer (a) ... x^5 [1]
 (b) ... $8x^6$ [2]
 (c) ... $\frac{2x^2y^2}{3}$ [2]

12. (a) Express 16 grams as a percentage of 10 grams.
 (b) Express the ratio

1 minute 20 seconds : 3 minutes 20 seconds

in the form $a : b$, where a and b are integers. Give your answer in its simplest form.

Answer (a) ... 160 % [1]
 (b) ... 2 : 5 [2]

13. Evaluate.

(a) $-11 + 9 - 3$

(b) $(-4)^3$

(c) $10 + 8 \div 2$

Answer (a) $\dots -5 \dots$ [1]

(b) $\dots -64 \dots$ [1]

(c) $\dots 14 \dots$ [1]

14. (a) A shopkeeper bought an article for Rs 90 and sold it for Rs 135. Calculate the percentage profit.

(b) A man borrows a sum of Rs 200 000 from a bank which charges simple interest at the rate of 15 % per annum. Calculate the total amount that the man must pay.

Answer (a) $\dots 50 \dots$ % [1]

(b) Rs $\dots 230,000 \dots$ [2]

15. (a) A train takes $1\frac{1}{4}$ hours to travel from station A to station B. If A and B are 200 km apart, calculate the average speed of the train.

(b) If the train left A at 11. 55 a.m., calculate the time at which it reached B.

Answer (a) $\dots 160 \text{ km/h} \dots$ [2]

(b) $\dots 13.10 \dots$ [2]

16. In a group of 30 children, 18 speak English and 14 speak French and 3 speak neither English nor French.
 (a) How many children speak both English and French?
 (b) How many children speak French only?

Answer (a) ... 5 [2]
 (b) ... 9 [1]

17. (a) Solve the inequality $7 - 2x > 15$.
 (b) Write down the prime number which is greater than 25 but smaller than 30.

Answer (a) ... $x < -4$ [2]
 (b) ... 29 [1]

18. (a) Find the H.C.F. of 60 and 75.
 (b) Find the L.C.M. of $124x^2y$ and $15x^3y^2z$.

Answer (a) ... 15 [2]
 (b) ... $1860x^3y^2z$ [2]

19. Solve the following equations.

(a) $5x + 7 = 2x + 28$

(b) $2x^2 - 50 = 0$

(c) $\frac{4x + 5}{3} = \frac{x}{2}$

Answer (a) ... $x = 7$... [2]

(b) ... $x = \pm 5$... [2]

(c) ... $x = -2$... [2]

20. A rectangular empty box measures 20 cm by 10 cm by 8 cm.

(a) Find the capacity (volume) of the box.

(b) A solid cube has a length of 4 cm.

(i) Find the volume of the cube.

(ii) How many such cubes can be placed inside the box?

Answer (a) ... 1600 ... cm^3 [2]

(b) (i) ... 64 ... cm^3 [2]

(ii) ... 20 ... cubes [2]

21. (a) Find the sum of the interior angles of a polygon with 20 sides.
(b) Each interior angle of a regular polygon is 120° . Find the number of sides of this polygon.

Answer (a) ... ~~32400~~ ... [2]

(b) ... ~~6~~ ... [2]

22. In a clearance sale, all prices were reduced by 10%. During the sale, Jane bought an article for Rs 135.

- (a) If she paid with a note of Rs 500, calculate the change that she received back.
(b) Calculate the normal price of the article.

Answer (a) Rs ... ~~365~~ ... [1]

(b) Rs. ... ~~150~~ ... [2]

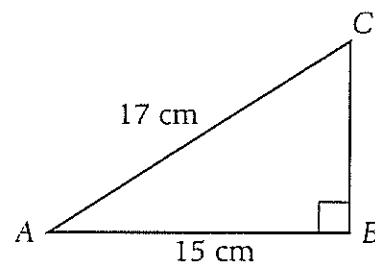
23. A machine fills water bottles at the rate of 12 bottles per minute.

- (a) How many bottles will the machine fill in 15 minutes?
(b) How long will the machine take to fill 2700 bottles? Give your answer in hours and minutes.

Answer (a) ... ~~180~~ ... bottles [1]

(b) ... ~~3~~ ... h ... ~~45~~ minutes [2]

24. The diagram shows a right-angled triangle ABC in which $AC = 17$ cm and $AB = 15$ cm.
Find the length of BC .

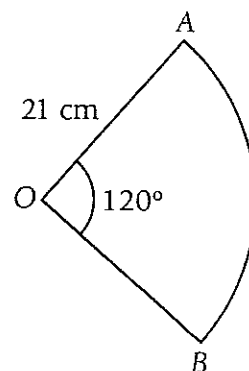


Answer (a) $BC = \dots 8 \dots$ cm [2]

25. The diagram shows the sector of circle with centre O and radius 21 cm.
Angle $AOB = 120^\circ$.

Taking the value of π to be $\frac{22}{7}$, find

- (a) the area of the sector,
(b) the perimeter of the sector.



Answer (a) $\dots 462 \dots$ cm² [2]
(b) $\dots 86 \dots$ cm [2]

26. (a) Write down the coordinates of one point on the line $y = 5$.

Answer (a) $(\dots 2 \dots, 5 \dots)$ [1]

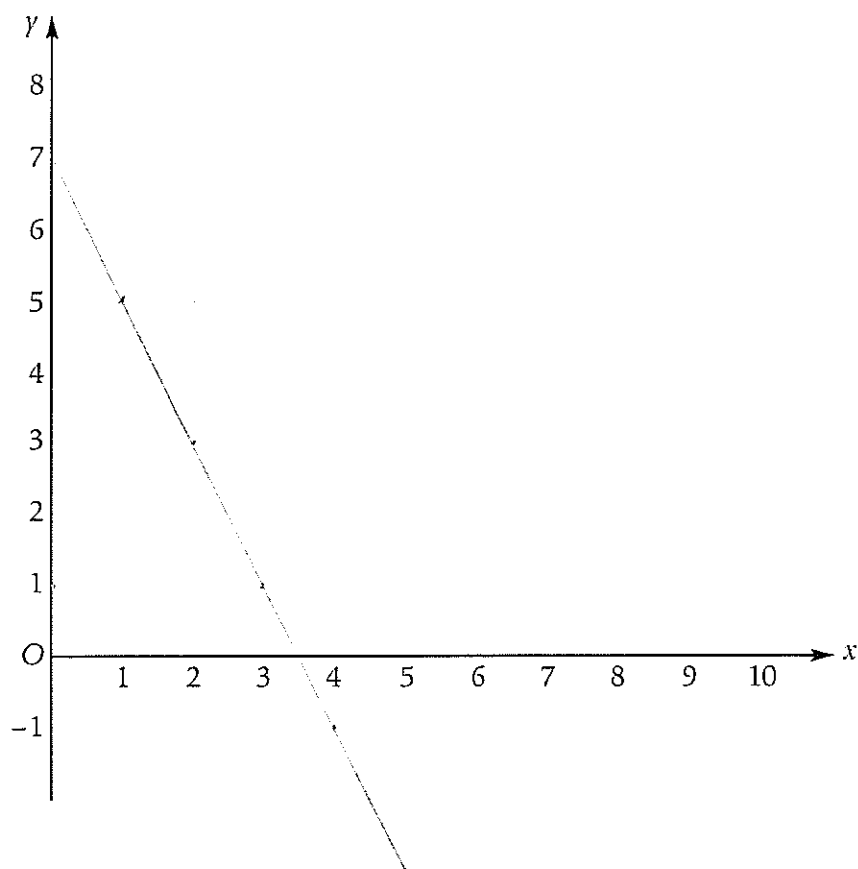
(b) The equation of a line is $y = 7 - 2x$.

(i) Complete the table below.

x	1	2	3	4
y	5	3	1	$\dots 1 \dots$
(x, y)	$(1, 5)$	$(2, 3)$	$(3, 1)$	$(4, \dots 1 \dots)$

[2]

(ii) On the grid provided below draw the line $y = 7 - 2x$.



[3]

TEST PAPER 3

1. Evaluate each of the following.

(a) $2^4 \times 3^2$

(b) $\sqrt[3]{125}$

(c) $\sqrt{10\,000}$

Answer (a) 144 [1]

(b) 5 [1]

(c) 100 [1]

2. Evaluate.

(a) $-12 + 7 - 10$

(b) $(-48) \div (-12)$

(c) $5 + 3 \times 4$

Answer (a) -15 [1]

(b) 4 [1]

(c) 17 [1]

3. Evaluate.

(a) $\frac{1}{4} + 1\frac{1}{8}$

(b) $3\frac{1}{3} - 2\frac{2}{5}$

(c) $\frac{8}{15} \div 12$

Answer (a) $1\frac{3}{8}$ [1]

(b) $1\frac{1}{15}$ [1]

(c) $\frac{2}{45}$ [1]

4. (a) Increase Rs 550 in the ratio 5 : 4.
 (b) A sum of Rs 4 500 is divided among three children, Kelina, Lovenia and Melinna in the ratio 3 : 5 : 7. How much more does Melinna receive than Kelina?

$$\frac{5}{4} \times 550$$

$$\frac{5}{4} \times 550 = 4 \overline{) 2750.00} = 687.50$$

$$\begin{array}{r} 500 \\ \times 5 \\ \hline 2500 \end{array}$$

Kelina	Lovenia	Melinna
3	5	7
100	150	210

12 shares = 4800
 1 share = 400
 7 shares = 2800
 5 shares = 2000

Answer (a) Rs ~~1200~~ 687.50 [2]
 (b) Rs ~~687.50~~ 1200 [1]

5. (a) A shopkeeper purchases a dozen copybooks for Rs 96.
 (i) Calculate the buying price of one copybook.
 (ii) He sells the copybooks for Rs 10 each. Calculate the percentage profit that he makes.
 (b) Express 64 cm as a percentage of 1.6 m.

Answer (a) (i) Rs. ~~8~~ 8 [1]
 (ii) ~~25~~ 25 % [1]
 (b) ~~40~~ 40 % [1]

6. Write down the next term in each of the following sequences.

(a) 2, 5, 9, 14, 20,

(b) 3, 9, 12, 21, 33,

Answer (a) ~~27~~ 27 [1]
 (b) ~~54~~ 54 [1]

7. Consider the set of numbers below.

2, 3, 4, 5, 7, 3, 4, 8, 2, 4

For this set, find

- (a) the mode,
(b) the median,
(c) the mean.

Answer (a) 4 [1]
(b) 4 [1]
(c) 4 : 2 [2]

8. (a) Solve the inequality $3x + 5 < 18$.
(b) Hence write down the largest integer value of x such that $3x + 5 < 18$.

Answer (a) $x < \frac{13}{3} = x < 4\frac{1}{3}$ [2]
(b) 4 [1]

9. (a) Find the rational number which is exactly midway between $\frac{3}{4}$ and $\frac{4}{5}$.
(b) Express 0.56 as a fraction in its lowest terms.

Answer (a) $\frac{31}{40}$ [1]
(b) $\frac{14}{25}$ [1]

10. (a) Express 4.2578 correct to 3 decimal places.
(b) Express 54 km/h in m/s.

Answer (a) 4.258 [1]
(b) 15 m/s [2]

11. A vessel contains 360 cm^3 of water. Water leaks out from the tank at the rate of $5 \text{ cm}^3/\text{s}$. How long will it take for the tank to become empty? Give your answer in minutes,

Answer 12 minutes [2]

12. A map is drawn to a scale of $1 : 200\,000$. On the map, the distance between two towns is 8.5 cm . Find the actual distance between the towns. Give your answer in km.

Answer 1.7 km [2]

13. Solve the following equations.

(a) $4x + 9 = 31$

(b) $\frac{2}{x+1} = \frac{5}{2x-1}$

(c) $x^2 = 64$

Answer (a) ... 5 ... [2]
 (b) ... 7 ... [3]
 (c) ... 8 ... [2]

14. (a) Find the L.C.M. of 84 and 120.

(b) Find the H.C.F. of $18x^3y^2$ and $45x^3y^4$.

Answer (a) ... 840 ... [2]
 (b) ... $9x^3y^2$... [2]

15. Simplify the following expressions.

(a) $9x - 4y + 3x + 7y$

(b) $\frac{12x^3y^5}{20xy^2}$

Answer (a) $12x + 3y$ [2]
 (b) $\frac{3x^2y^3}{5}$ [2]

16. Convert

(a) 3.58 km into m,

(b) 1.6 hours into minutes,

(c) 760 g into kg.

Answer (a) ... 3580 m [2]
 (b) ... 96 ... minutes [2]
 (c) ... 0.76 kg [2]

17. Factorise completely.

(a) $16 - 24x$

(b) $y^2 + 3y$

(c) $kx - 2ky - x + 2y$

Answer (a) ... $4(x-3)$... [2]
 (b) ... $y(y+3)$... [2]
 (c) ... $(x-2y)(k-1)$... [2]

18. Calculate the simple interest when a sum of Rs 250 000 is invested for 3 years at the rate of 8 % per annum.

Answer Rs... 60000 [3]

19. In a shop, a salesperson receives a commission of 2 % when he sells an article.
 (a) A salesperson sells a wardrobe for Rs 14 000. Calculate her commission.
 (b) Another salesperson sells a drawer and receives a commission of Rs 400. Calculate the selling price of the drawer.

Answer (a) ... 280 [2]
 (b) ... 20 000 [3]

20. (a) A closed rectangular box has a length of 20 cm, a width of 12 cm and a height of 8 cm. Find the volume of the box.
 (b) The total surface area of a solid cube is 150 cm^2 .
 (i) Find the area of one face of the cube.
 (ii) Find the length of one edge of the cube.

Answer (a) ... 1920 cm^3 [3]
 (b) (i) ... 2.5 cm^2 [2]
 (ii) ... 5 cm [2]

21. (a) Each exterior angle of a regular polygon is 12° . Find the number of sides of this polygon.
 (b) Five of the interior angles of a heptagon are 100° each. Find the sum of remaining two angles.

Answer (a) 30 [2]

(b) 400 [3]

22. Use $\pi = 3.14$ in this question.

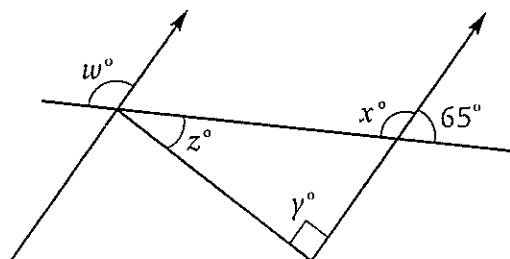
The diameter of a circle is 40 cm.

- (a) Find the circumference of this circle.
 (b) Find the area of this circle.

Answer (a) 125.6 cm [2]

(b) 1256 cm². [3]

23. Find the size of the unknown angles marked with letters in the diagram given below.



Answer $w = \dots\dots 115^\circ \dots\dots$ [1]

$x = \dots\dots 115^\circ \dots\dots$ [1]

$\gamma = \dots\dots 90^\circ \dots\dots$ [1]

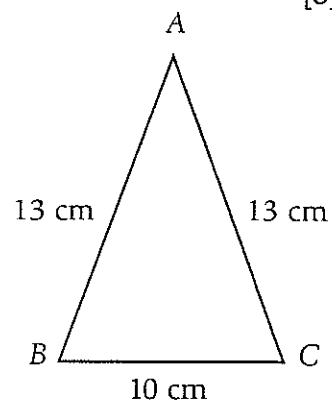
$\gamma = \dots\dots 25^\circ \dots\dots$ [1]

24. The diagram shows an isosceles triangle ABC . $AB = AC = 13$ cm and $BC = 10$ cm.

(a) Show that the height of the triangle is 12 cm. [3]

(b) Calculate the perimeter of the triangle.

(c) Calculate the area of the triangle.



Answer (b) ³⁶ cm [1]
 (c) ⁶⁰ cm² [2]

25. (a) Write down the equation of the straight line which passes through the points (3, 4), (5, 4) and (7, 4).

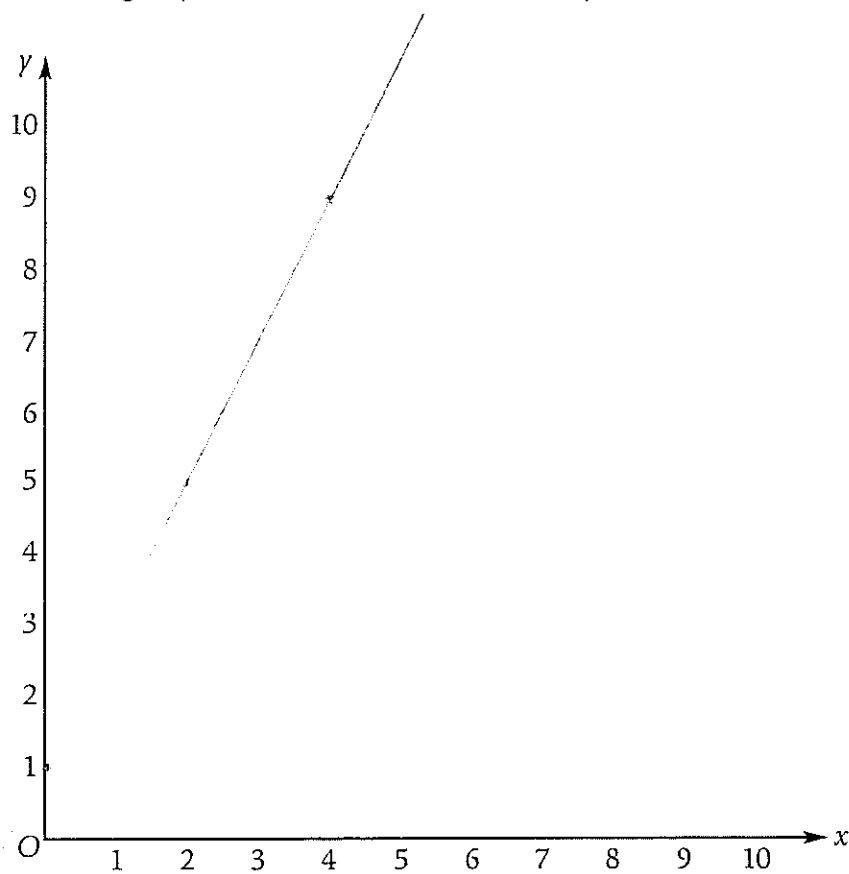
Answer (a) ... $y = 4$ [1]

- (b) The equation of a line is $y = 2x + 1$.

(i) Complete the table below.

x	0	2	4
y		5	9
(x, y)	$(0, \dots)$	$(2, 5)$	$(4, 9)$

- (ii) On the grid provided below, draw the line $y = 2x + 1$.



[3]