Answer ALL questions.
ALL working must be clearly shown.

1. (a) Determine the value of $\frac{2}{3} \times \left[\frac{5}{12} \div \frac{1}{9}\right]$, giving your answer a decimal.

……

(3 marks)

(b) (i) Write the following numbers correct to ONE (1) significant figure.

99.25 ……..……..

2.13 ……..……..

(2 marks)

(ii) Hence, estimate the integer value of

$$\frac{8+\sqrt{99.25}}{2.13}$$

……

(2 marks)

(c) Write correct to 2 decimal places.

(i) 0.00813 ……

(1 mark)

(ii) 158.974 ……

(1 mark)

(d) Evaluate $\frac{\sqrt[3]{8}}{2^5}$, giving your answer as a fraction in simplest form.

……

(2 marks)

TOTAL 11 MARKS

2. (a) Simplify

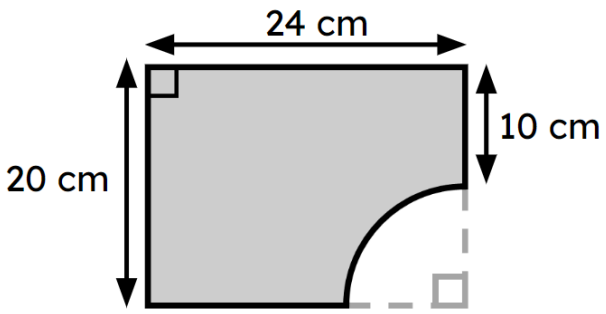
(i) $4x - (2y - 3x)$

(2 marks)

(ii) $5a(2a + b) + a(b - 2a) - 10ab$

(3 marks)

(b) The diagram below shows a rectangular concrete block with a quarter circle, center *O*, cut out.



Use $\pi = 3.14$

(i) State the radius of the quarter circle.

……

(1 mark)

(ii) Calculate

(a) the area of the concrete block before the cut out portion.

……

(1 mark)

(b) the area of the cut out portion.

……

(2 marks).

(c) the area of the concrete block that is left..

……

(1 mark)

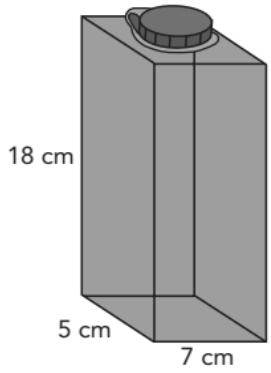
TOTAL 10 MARKS

3. (a) Simplify the expression $7p^5q^3 \times 2p^2q$

……

(2 marks)

(b) Sari has a water bottle that is a rectangular prism, measuring 7cm by 5cm by 18 cm. She fills it completely with water.



(i) Calculate, in cm^3, the volume of water in the bottle.

.....

(2 marks)

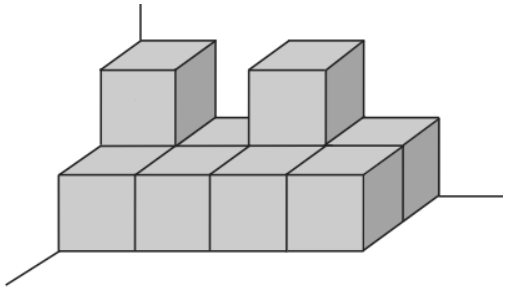
Sari drinks $\frac{1}{3}$ of the volume of water in her bottle.

(ii) Calculate, in cm^3, the volume of water left.

.....

(2 marks)

(c) The diagram below shows a solid figure made up of cubes. The **TOTAL** volume of the solid is 270cm^3.



(i) What is the volume of one cube?

……

(1 mark)

(ii) What is the length of side of each cube?

……

(2 marks)

(c) A cuboid has a volume of 48cm^3. Using whole numbers greater than 1, complete the following to show two ***different*** combinations of length, width, and height for the cuboid.

(i) Length ……. Width …… Height ……

(ii) Length …… Width …… Height ……

(2 marks)

TOTAL 11 MARKS

4. (a) Factorize completely

(i) $xy - x$

(1 mark)

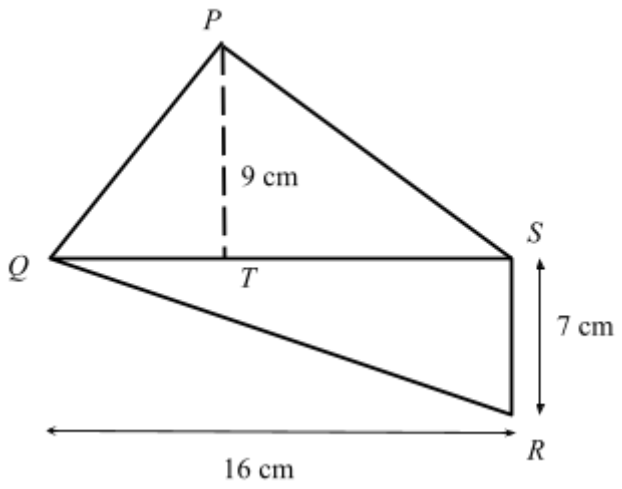
(ii) $2a^2b - 5ab^2$

(2 marks)

(iii) $18p^2q^3r^2 + 9p^3qr^4 - 36p^2q^2r^5$

(3 marks)

(b) The diagram below, **not drawn to scale**, show a figure *PQRS* made up of triangles *PQS* and *QRS*. Calculate the area of the figure.



4 marks
TOTAL 10 MARKS

5. (a) Write as a single fraction in lowest terms possible.

(i) $\frac{5}{w} + \frac{2}{3w}$

(1 mark)

(ii) $\frac{12}{5x} - \frac{3}{7xy}$

(2 marks)

(iii) $\frac{5p+2}{4} - \frac{3p-1}{3}$

(3 marks)

(b) Simplify the following.

(i) $\frac{4}{25x} \times \frac{15x^2}{16}$

(2 marks)

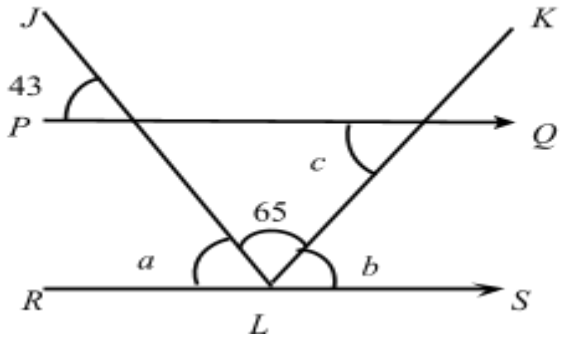
(ii) $\frac{4a^2b}{7} \div \frac{8a^2b^4}{14}$

(3 marks)

TOTAL 11 MARKS

GO ON TO THE NEXT PAGE

6. (a) In the diagram below, **not drawn to scale**, *PQ* and *RS* are two parallel lines cut by transversals *JL* and *KL*.



Calculate, giving reasons for your answer, the size of angles

(i) *a*

……

(2 marks)

(ii) *b*

……

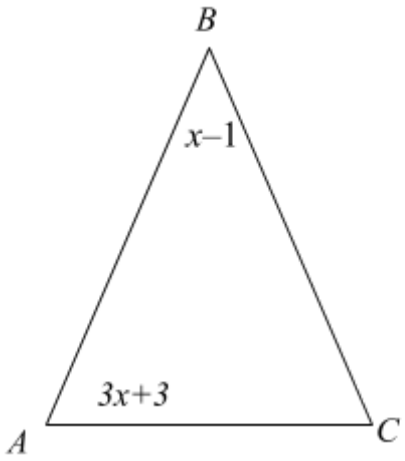
(2 marks)

(iii) *c*

……

(2 marks)

(b) The diagram below, **not drawn to scale**, shows a triangle ABC in which $AB = BC$.



(i) What type of triangle is ABC?

……

(1 mark)

(ii) Write an equation, in x, to represent the sum of the angles in the triangle.

……

(1 mark)

(iii) Solve for x.

……

(2 marks)

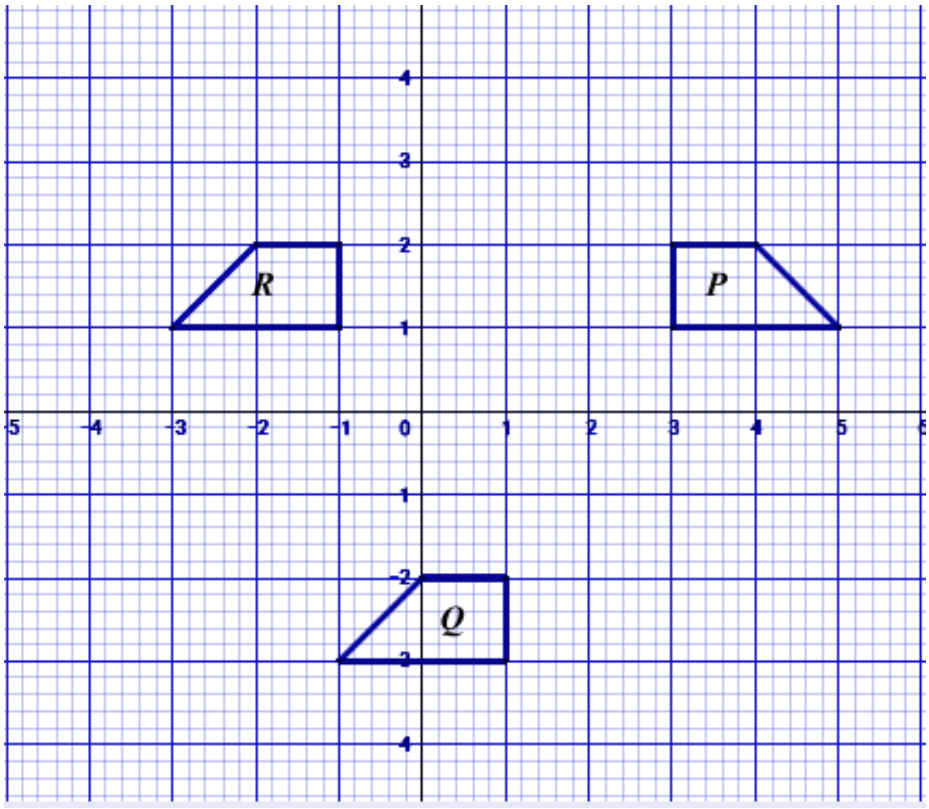
(iv) State the size of angle C.

……

(1 mark)

TOTAL 11 MARKS

7. (a) The diagram below shows three quadrilaterals *P*, *Q* and *R*. Quadrilaterals *Q* and *R* are the images of Triangle *P* after it undergoes a double transformation.



Describe **FULLY** the transformations that maps Quadrilateral

(i) *P* unto Quadrilateral *R*

……

……

(2 marks)

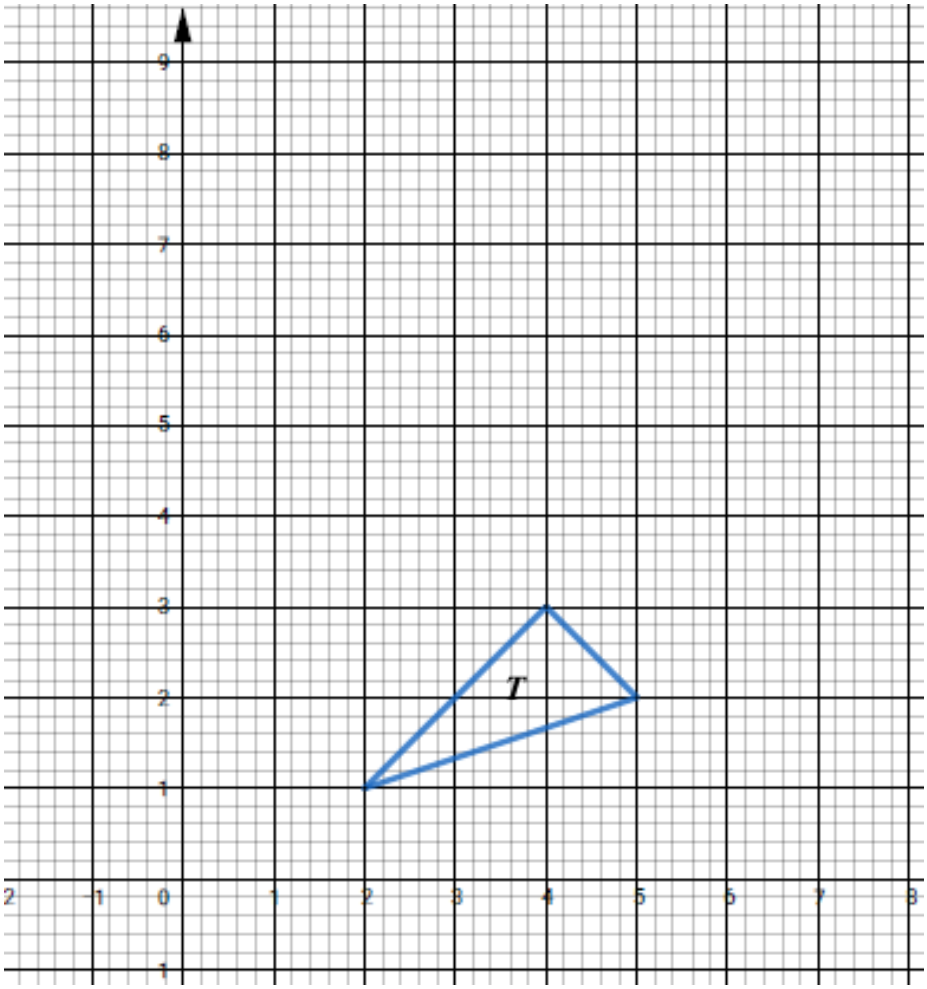
(ii) *R* unto Quadrilateral *Q*

……

……

(2 marks)

(b) The diagram below shows a triangle *T*.



(i) On the diagram above, draw the image of shape *T* after a reflection in the line $y = x$. Label this image *E*.

(3 marks)

(ii) On the diagram above, draw the image of shape *T* after it undergoes a translation by the vector $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$. Label this image *F*.

(2 marks)

(iii) State **ONE (1)** geometric property of a translation.

.....

(1 mark)

TOTAL 10 MARKS

8. (a) (i) Complete the table below for the relation: $y = x^2 - 1$ for $-3 \leq x \leq 3$

x	-3	-2	-1	0	1	2	3
y	8			-1		3	

(2marks)

(ii) On the graph paper provided, **using a scale of 2 cm to 1 unit the *x*-axis and 1 cm to 1 unit on the *y*-axis**, draw the graph of the relation.

(3 marks)

(b) (i) Complete the table of values below for the relation $y = -2x + 2$.

x	-3	-2	-1	0	1	2
y		–6		2		

(2 marks)

(ii) On the **SAME** axes, draw the graph of $y = -2x + 2$ for the given domain.

(2 marks)

(iii) Write down the coordinates of the points where the two graphs intersect.

(a) ……

(1 mark)

(b) ……

(1 mark)

TOTAL 11 MARKS

END OF EXAM