

Time: 1 hour and 35 minutes

INSTRUCTIONS

This paper has 16 questions and 3 printed pages.

Answer ALL questions. ALL working MUST be shown. Calculators are **NOT** allowed.

The marks awarded for each question are indicated in square brackets.

Write your name clearly on **EACH** sheet of paper used.

Number your responses identically as they appear on the question paper and do **NOT** write your responses beside each other.

1. Insert the next two terms in each of the following sequences
 - (a) 10, 15, 20, 25, _____, _____ [2]
 - (b) 0, 1, 8, _____, _____ [2]

2. Evaluate each of the following
 - i. $(0.02)^2$ [2]
 - ii. $5.890 \div 0.19$ [3]
 - iii. $(-1)^2 + (-2)^3$ [3]

3. Make x the subject of each of the following
 - i. $m = 5ax$ [1]
 - ii. $y = 2x + 1$ [2]

4. Write each of the following in standard form
 - i. 60 million [2]
 - ii. 0.0020 [2]
 - iii. 357.24 [2]

5. Simplify each of the following
 - (a) $4 - 3(x - 5)$ [3]
 - (b) $(8 + 3) \times 2 + 10 \div (6 - 1)$ [5]

6. A girl is x cm tall. Her father is 4 times her height. Her sister is $\frac{1}{9}$ of her height.
- (a) Express the height of (i) the father (ii) the sister, each in terms of x . [2]
- (b) Write down and **simplify** an expression for the difference in height between the father and sister. [2]

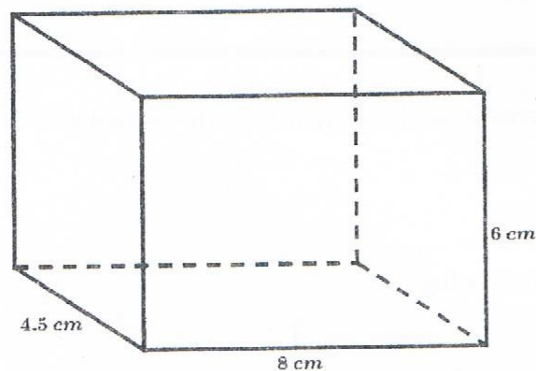
7. Solve each of the following

- i. $5x + 7 = 19 - x$ [5]
- ii. $3(6 + 7x) + 2(1 - 2x) = 0$ [8]
- iii. $2x \geq 5x + 6$ [4]

8. The diagram below shows a cuboid with dimensions 6 cm, 8 cm and 4.5 cm.

Find, giving the correct units

- i. the volume [3]
- ii. the total surface area [4]



9. (a) List the members of the set {integer x : $-5 < x \leq 1$ } [6]
- (b) Given that $U = \{a, b, c, d, e\}$, $A = \{b, c, e\}$ and $B = \{a, e\}$
List the members of the following sets
- i. B' [3]
- ii. A' [2]
- iii. $A' \cup B'$ [4]
- iv. $A \cap B'$ [2]

10. In a class of 30 students, 22 like French, 12 like Spanish, 6 like neither French nor Spanish.

- (a) Show this information in a carefully labelled Venn Diagram [4]
- (b) Hence find the number of students who like
- i. both French and Spanish [3]
- ii. French only [1]
- iii. Spanish only [1]

11. A motorist travels for 1 hour at an average speed of 72 km/h and then for 2 hours at an average speed of 90 km/h. Find the average speed of the whole journey. [4]

12. (i) Using ruler and compasses only, construct triangle $PQ = 8.4$ cm, angle $Q = 60^\circ$ and $QR = 4.2$ cm. [3]

(ii) Measure and state (a) the size of angle PRQ (b) the length of PR . [2]

13. The scale of a map is given as 1: 200 000

(a) Calculate the actual distance, **in km**, between two towns whose distance apart on the map is 3.8 cm. [2]

(b) If two hills are 14.8 km apart, calculate the distance, **in cm**, between them on the map. [3]

14. Given that \$600 was invested for $2\frac{1}{2}$ years at the rate of 5% per annum simple interest.

Calculate (a) the interest earned (b) the amount [3]

15. Triangle ABC is an isosceles triangle with $AB = AC = 13$ cm and $BC = 10$ cm.

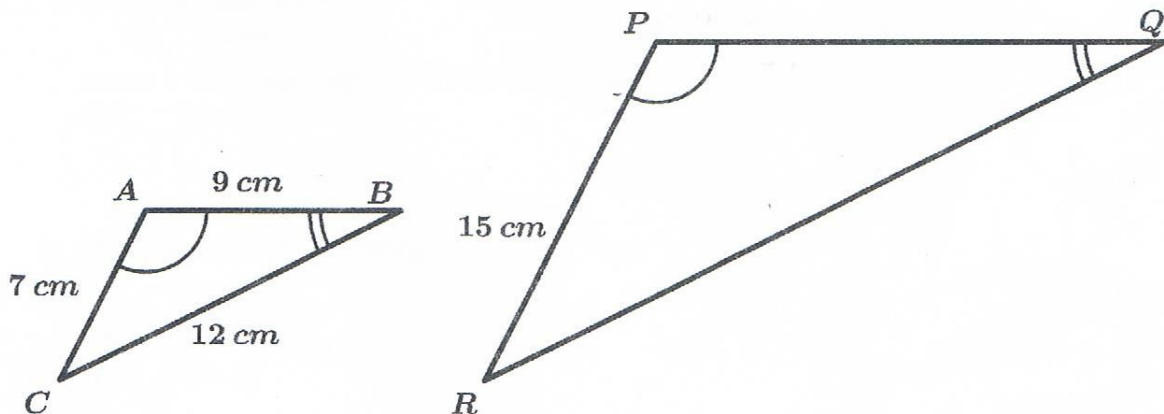
(Solving this question using measurement or construction will not be accepted)

i. sketch a fully labelled diagram to show this information. [1]

ii. calculate the height, AX , of the triangle. [3]

iii. hence, find the area of the triangle. [2]

16. In the figure, $\triangle ABC$ is similar to $\triangle PQR$. Using the data in the figures and given that $AB = 9$ cm, $AC = 7$ cm, $BC = 12$ cm, and $PR = 15$ cm.



Leaving your answer in fractional form, calculate the length of

(a) QR (b) PQ [4]

End of Examination