

2003

140 COPIES

1½ HOURS

Answer **ALL** questions. All necessary working **MUST** be shown. Tables are provided.

1.
 - a) If $U = \{f, a, c, t, o, r, i, s, e\}$, $P = \{r, a, t, i, o\}$ and $Q = \{s, e, t\}$ draw a Venn diagram representing the information.
 - b) Using the information for U, P, Q find the following
 - i. $(P \cup Q)'$
 - ii. $P \cap Q$
 - iii. $(P \cup Q)' \cap (P \cap Q)$
 - iv. $n(P \cup Q)$
2. Solve the following equations
 - a) $5(3m + 4) = 3(4m + 7)$
 - b) $\frac{23 - 3x}{x + 1} = \frac{4}{3}$
 - c) $\frac{3}{4}x - 1\frac{2}{3} = \frac{2}{3}x$
3. Simplify the following
 - a) $5(2y - x) + 6x$
 - b) $\frac{9a - 5}{5} - \frac{3a - 2}{2}$
 - c) $a^{-8} \div a^4$
4. If Zena is x years old and Joseph is 11 years older than Zena, write Joseph's age as an expression in terms of x . Hence solve for x if in 5 years time Joseph will be twice as old as Zena. Then state the ages of Zena and Joseph.
5. A ladder leans against a wall. The ladder reaches 5m up the wall and its foot is 2m from the wall. If the foot of the ladder is placed 1 m further from the wall, calculate how far the ladder then reaches. Give your answer to 3 significant figures.
6. Solve the following
 - a) $4x + 4 > 7$
 - b) $2x - 2 \geq \frac{x + 2}{2}$
 - c) An isosceles triangle has sides of length y cm, y cm and 9 cm. Its perimeter is less than 24 cm and y is a whole number.
 - i. Find the lowest value of y

ii. Find the highest value of y

7. Solve the following

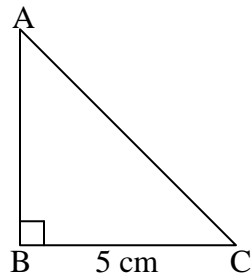
a) $0.05181 \div 3.14$

b) $3.4 \times 10^{-3} + 6.2 \times 10^{-3}$

Expressing each answer

- i. Correct to three significant figures
- ii. Correct to two decimal places
- iii. In standard form

8. $\triangle ABC$ is right-angled at B and $BC=5$ cm



- a) If the area of $\triangle ABC$ is 30 cm^2 , find the length of AB.
- b) Hence find the length of AC.

9. The transformation, M, denotes a reflection in the line $x=2$. On graph paper, using a scale of 2cm to 1 unit on both the x and y axes plot the point $A(4,2)$ and $B(3,1)$. Join AB. Then draw $A'B'$ which is the image AB under the transformation M