Measurement & Geometry

Question 1 **(5 marks)**

(a) Calculate the perimeter of the garden. (2 marks)

Solution
$P = 2(l + w)$
$P = 2(4.5 + 3)$
$P = 2 \times 7.5 = 15$ m

Specific behaviours
✓ correct substitution into the perimeter formula
✓ correct final answer, 15 m

(b) Calculate the area of the garden. (1 mark)

Solution
$A = l \times w$
$A = 4.5 \times 3 = 13.5$ m^2

Specific behaviours
✓ correct final answer, 13.5 m^2

(c) A triangular herb bed is attached along the 3 m side of the garden. The triangular bed has a base of 3 m and a height of 2 m. Calculate the area of the triangular herb bed. (2 marks)

Solution
$A = (\text{base} \times \text{height}) \div 2$
$A = (3 \times 2) \div 2$
$A = 6 \div 2 = 3$ m^2

Specific behaviours
✓ correct substitution into the triangle area formula
✓ correct final answer, 3 m^2

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Question 2 **(6 marks)**

(a) A cereal box in the shape of a rectangular prism has length 20 cm, width 8 cm and height 30 cm. Calculate the volume of the cereal box, in cm^3. (2 marks)

Solution
$V = l \times w \times h$
$V = 20 \times 8 \times 30$
$V = 4800\ cm^3$

Specific behaviours
✓ correct substitution into the volume formula
✓ correct final answer, 4800 cm^3

(b) The following parts are not related to the cereal box above. Two angles meet on a straight line. One of the angles is 112°. Calculate the size of the other angle. (2 marks)

Solution
Angles on a straight line sum to 180°.
Missing angle = 180° − 112°
Missing angle = 68°

Specific behaviours
✓ uses the fact that angles on a straight line sum to 180°
✓ correct final answer, 68°

(c) Two straight lines cross each other. One of the angles formed is 73°. State the size of the angle vertically opposite it, and explain how you know. (2 marks)

Solution
Vertically opposite angles are always equal.
The angle vertically opposite 73° is also 73°.

Specific behaviours
✓ states that vertically opposite angles are equal
✓ correct final answer, 73°

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Number & Algebra

Question 3 **(5 marks)**

(a) Calculate (−8) + (−5) − (−10). (2 marks)

Solution
(−8) + (−5) − (−10) = −8 − 5 + 10 = −3

Specific behaviours
✓ correctly rewrites subtracting a negative as adding 10
✓ correct final answer, −3

(b) Calculate $\frac{3}{4} + \frac{1}{8}$, giving your answer as a single fraction. (2 marks)

Solution
$\frac{3}{4} + \frac{1}{8}$ $= \frac{6}{8} + \frac{1}{8}$ $= \frac{7}{8}$

Specific behaviours
✓ converts 3/4 to the common denominator of 8 (6/8)
✓ correct final answer, 7/8

(c) Calculate 2.7 × 4. (1 mark)

Solution
2.7 × 4 = 10.8

Specific behaviours
✓ correct final answer, 10.8

TOP RANKED TUTORING

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Question 4 **(6 marks)**

(a) Maya tutors at Top Ranked Tutoring. Let a stand for the number of hours she tutors, and let b stand for the number of students she has in a group. Simplify 5a + 3b − 2a + b by collecting like terms. (2 marks)

Solution
5a + 3b − 2a + b
= (5a − 2a) + (3b + b)
= 3a + 4b

Specific behaviours
✓ correctly collects the a terms to give 3a
✓ correctly collects the b terms to give 4b

(b) Maya's pay in dollars for a shift can be modelled by 3a + 7. Calculate her pay if a = 4. (2 marks)

Solution
3a + 7
= 3(4) + 7
= 12 + 7 = $19

Specific behaviours
✓ correctly substitutes a = 4
✓ correct final answer, $19

(c) The following part is not related to Maya's tutoring above. Solve the equation 2x + 5 = 17 for x. (2 marks)

Solution
2x + 5 = 17
2x = 17 − 5 = 12
x = 12 ÷ 2 = 6

Specific behaviours
✓ correctly isolates the term with x to give 2x = 12
✓ correct final answer, x = 6

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Statistics & Probability

Question 5 **(4 marks)**

(a) Calculate the mean amount Priya saved per week. (2 marks)

Solution
Mean = (8 + 12 + 8 + 15 + 7) ÷ 5
Mean = 50 ÷ 5
Mean = $10

Specific behaviours
✓ correct total of all five values, 50
✓ correct final answer, $10

(b) State the mode of this data set. (1 mark)

Solution
$8 occurs twice, more often than any other value.
Mode = $8

Specific behaviours
✓ correct final answer, $8

(c) Calculate the range of this data set. (1 mark)

Solution
Range = highest value − lowest value
Range = $15 − $7 = $8

Specific behaviours
✓ correct final answer, $8

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Question 6 **(5 marks)**

(a) What is the probability that Mia picks a blue lolly? Give your answer as a fraction. (2 marks)

Solution
Total number of lollies = 5 + 3 + 2 = 10
P(blue) = $\frac{3}{10}$

Specific behaviours
✓ correct total number of lollies, 10
✓ correct final answer, 3/10

(b) What is the probability that Mia picks a lolly that is NOT green? Give your answer as a fraction in simplest form. (2 marks)

Solution
P(green) = $\frac{2}{10}$
P(not green) = $1 - \frac{2}{10} = \frac{8}{10}$
P(not green) = $\frac{4}{5}$

Specific behaviours
✓ correctly finds P(not green) = 8/10 before simplifying
✓ correct final simplified answer, 4/5

(c) How many more red lollies are there than green lollies? (1 mark)

Solution
Red − green = 5 − 2
= 3 more red lollies

Specific behaviours
✓ correct final answer, 3

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