The Maths And Science Tutor

Practice Worksheet

Date: 07 December 2024

General Marking Principles

- All candidates must receive the same treatment
- Marks awarded must be in line with the mark scheme
- Method marks (M) are awarded for a correct method or partial method
- Accuracy marks (A) are awarded for a correct answer following correct working
- Follow through marks (ft) may be awarded where appropriate
- Unless stated otherwise, accept equivalent methods

Question 1 (3 marks)
M1: States $y = k\sqrt{x}$ or equivalent
M1: Uses $y = 24$ when $x = 16$ to find k ($k = 6$)
A1: (a) $y = 6\sqrt{x}$ and (b) $y = 36$

Question 2 (3 marks)
M1: States $V = kr^3$ or recognizes ratio $523.6 : V = 5^3 : 8^3$
M1: Sets up calculation ($523.6 \times 8^3/5^3$)
A1: 2145.4 (cm³)
Alternative method:
M1: Uses scale factor of 8/5 for radius
M1: Cubes scale factor and multiplies by original volume

Question 3 (4 marks)
M1: States $t = k/n$ or equivalent
M1: Uses $t = 6$ when $n = 4$ to find k ($k = 24$)
M1: Substitutes correctly into $t = 24/n$
A1: (b) 2.4 hours, (c) 12 workers

Question 4 (3 marks)
M1: States $y = kx^2$ or equivalent
M1: Uses $y = 50$ when $x = 2$ to find k ($k = 12.5$)
A1: 312.5 items

Question 5 (3 marks)
M1: Finds scale factor (2.5) using ratio AB:PQ

M1: Multiplies both remaining sides by scale factor
A1: QR = 30cm, PR = 37.5cm

Question 6 (2 marks)
M1: Uses ratio of areas = ratio of radii squared
A1: k = 25/9 or 2.777...

Question 7 (3 marks)
M1: States F = ke or equivalent
M1: Uses F = 40 when e = 5 to find k (k = 8)
A1: 8.75cm

Question 8 (4 marks)
M1: Recognizes $V \propto r^2 h$
M1: Substitutes $r \rightarrow 2r$ and $h \rightarrow h/2$
M1: Simplifies ratio correctly
A1: (a) Volume ratio 2:1, (b) Surface area ratio 2:1

Question 9 (3 marks)
M1: States $T = k\sqrt{L}$ or equivalent
M1: Uses T = 3 when L = 2.25 to find k (k = 2)
A1: T = 4 seconds

Question 10 (2 marks)
M1: Forms equation $12 \times 3^2 = k = 3x^2$
A1: x = 6

Notes:

- Award full marks for alternative valid methods
- Follow through marks may be awarded where appropriate
- Accept equivalent forms unless otherwise stated