

# **PRACTICE PAPER SOLUTIONS**



*Rewarding Learning*

**General Certificate of Secondary Education**

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## **Mathematics**

Unit **M8** Paper 2

**Calculator**

Higher Tier

**PRACTICE**

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**MARK  
SCHEME**

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| <b>1</b> | $90 - 60 = 30$   | MA1 |
|          | $60 \times 0.35 = 21$  | MA1 |
|          | $30 \times 0.6 = 18$   | MA1 |
|          | $21 + 18 = 39$   | MA1 |
| <b>2</b> | $-3 < y < 2$   | MA1 |
|          | $-3, -2, -1, 0, 1$   | A1  |
| <b>3</b> | Arc drawn 5 cm from X  | MA1 |
|          | Arc drawn 6 cm from Y  | MA1 |
|          | Region shaded  | A1  |
| <b>4</b> | $5x + x = 180$   | MA1 |
|          | $x = 30$   | A1  |
|          | Number of sides = $360 \div 30 = 12$                                   | MA1 |
| <b>5</b> | (a) $0.34 \times 200$  | M1  |
|          | 68   | A1  |
|          | (b) 0.32   | A1  |
|          | because more spins means that it is more reliable                      | A1  |
| <b>6</b> | $17 \times 21 = 357$   | MA1 |
| <b>7</b> | $(2.9979 \times 10^8) \div (3.4 \times 10^2)$ or 881735.2941 or 880000 | MA1 |
|          | $8.8 \times 10^5$  | A1  |

**8** (a)  $960 = k \times 64$  MA1

$k = 15$  hence  $y = 15x^3$  MA1

(b)  $405 \div 15 = x^3$  MA1

$x = 3$  A1

**9** Diagram with angles (27, 144, 9, 36) and 30m MA1

Either hypotenuse calculated  $\frac{30 \sin 144^\circ}{\sin 9^\circ} = 112.72169$  **or**

$\frac{30 \sin 27^\circ}{\sin 9^\circ} = 87.06339$  M1A1

height =  $112.72169 \sin 27^\circ = 51.174577$  **or**

$86.06339 \sin 36^\circ = 51.174577$  M1A1

**10** (a)  $\frac{3}{5}$

Dry  $\frac{7}{10}$  A1

$\frac{2}{5}$

$\frac{1}{5}$

Wet  $\frac{3}{10}$  A1

$\frac{4}{5}$

(b)  $\frac{7}{10} \times \frac{3}{5} + \frac{3}{10} \times \frac{1}{5}$  MA1

$= \frac{24}{50} \left( \frac{12}{25} \right)$  MA1

**11** Gradient of radius =  $-\frac{12}{5}$  MA1

Gradient of tangent =  $\frac{5}{12}$  MA1

$$y = \frac{5}{12}x + c$$

$$-12 = \frac{5}{12}(5) + c$$

$$c = -12 - \frac{5}{12}(5) = -\frac{169}{12}$$

$$y = -\frac{5}{12}x - \frac{169}{12} \quad \text{M1A1}$$

$$12y = -5x - 169$$

$$12y + 5x + 169 = 0 \quad \text{A1}$$

**12** Area of square =  $4r^2$  MA1

Shaded area =  $4r^2 - \pi r^2$  MA1

$$\text{Prob. (shaded area)} = \frac{4r^2 - \pi r^2}{4r^2} = 1 - \pi/4 \quad \text{or} \quad \text{MA1A1}$$

$$\text{Prob. (unshaded area)} = \frac{\pi r^2}{4r^2} = \pi/4 \quad \text{so}$$

$$\text{Prob. (shaded area)} = 1 - \pi/4$$

**13** AC =  $\sqrt{(16^2 + 30^2)} = 34$  M1A1

Height =  $34 \tan 21^\circ = 13.05$  M1A1

14

$$\frac{9}{3} = \frac{6}{2} \text{ so radius of base of top cone} = 2 \text{ cm} \quad \text{MA1}$$

Volume of large cone – volume of small cone

$$= \frac{1}{3} \pi (3^2 \times 9 - 2^2 \times 6) \quad \text{MA1}$$

$$= \frac{1}{3} \pi \times 57 \quad \text{MA1}$$

$$= 19 \pi \quad \text{A1}$$

$$\text{Weight of metal} = 19 \pi \times 14 = 835.66 \quad \text{MA1}$$