

1. SIGHT OF -75 **BI**
 $5y = -40^\circ \dots$ **M1**
 $y = -8^\circ \dots$ **M1**
 $28^\circ, 64^\circ$ **A1, A1**

2. $8p + q - 148$ **M1**
 $-\frac{27}{8}p + q - 57$ **M1**
 $"8p + q - 148" = "-\frac{27}{8}p + q - 57"$ **M1 A1**
 ATTEMPTS A SOLUTION (AT LEAST ONE SIGNIFICANT STEP) **M1**
 TO GET AN EQUATION IN p
 SHOWS CORRECTLY $p=8$ **A1**

3. a) $\frac{a}{2} = 5$ OR SIMILAR **M1**
 $a=10$ **A1**

b) COMPLETES THE SQUARE IN x & y **GOOD ATTEMPT** **M1** **M1**
 (MAY APPEAR IN a) **(full simplification)**
 SHOWS 49 **M1**
 STATE RADIUS = 7 **A1**

4. a) $1 + \frac{5}{2}x + \frac{45}{16}x^2 + \frac{15}{8}x^3$ **A1 A1 A1 M1** FOR SHOWING OF METHOD

b) INDICATES $x=0.1$ **BI**
 SHOWS $1 + \frac{5}{2}(0.1) + \frac{45}{16}(0.1)^2 + \frac{15}{8}(0.1)^3$ **M1**
 OR $1 + \frac{1}{4} + \frac{9}{320} + \frac{3}{1600}$

SHOWS CORRECTLY $\frac{32}{25} = 1.28$ **A1**

5. a) $10 + 20 + 40 + 80 + 160 = 310$) M1
 OR $\frac{10 \times (2^5 - 1)}{2 - 1} = 310$

$\frac{310}{10} = 31$ A1

b) $20971510 = \frac{10(2^n - 1)}{2 - 1}$ o.e M1

$2097151 = 2^n - 1$) M1
 OR $2^n = 2097152$

$\log 2^n = \log 2097152$ M1

$n = \frac{\log 2097152}{\log 2}$ M1

$n = 21$ A1

ALLOW TRAIL & IMPROVEMENTS
 IF STEPS ARE SHOWN

6. a) $7^x = 10$

$\log 7^x = \log 10$ M1

$x \log 7 = \log 10$ M1

$x = 1.18$ c.a.o A1

b) $(\log_2 y)^2 = 9$ DON'T ALLOW $\log_2 y^2$ M1

$\log_2 y = \begin{matrix} 3 \\ -3 \end{matrix}$ BOTH ALLOW RECOVERY FROM $\log_2 y^2$ M1

steps 8 A1

$\frac{1}{8}$ A1

7. a) $\left(\frac{dc}{dv} =\right) 200V^{-2} + \frac{2}{25}$

M1 ATTEMPTS DIFFERENTIATE
M1 CORRECTLY DIFFERENTIATE

SETS EQUAL TO ZERO M1

SOLOWS EQUATION E.g. $2V^2 = 5000$ M1

$V = 50$ A1

b) SIGHT OF $400V^{-3}$ M1

SIGHT OF $\frac{40}{50^3}$ OR $\frac{40}{125000}$ O.E. > 0 A1

+ CONCLUSION

c) $\frac{200}{50} + \frac{2 \times 50}{25}$ M1

$(\frac{1}{\text{A}}) 8$ A1

8. $\frac{1}{2} r^2 \times \frac{\pi}{6}$ M1

$\frac{\pi r^2}{12}$ A1

$\frac{1}{2} a^2 \sin \frac{\pi}{6}$ M1

$\frac{1}{4} a^2$ A1

$\frac{1}{4} a^2 = \frac{1}{2} \times \frac{\pi r^2}{12}$ OR SIMILAR M1

MANIPULATING SIMPLIFIED TO $\sqrt{\frac{\pi}{6}} r$ A1

9. STATES/INPUTS $A(8,0)$ **B1**

COMPLETES THE SQUARE, USES CAVES, OR USES SYMMETRY TO FIND THE 2 COORDS OF M **B1**

SHOWS OR INPUTS $M(4,16)$ **A1**

" $\frac{1}{2} \times 4 \times 16$ " = 32 **M1**

$\int_0^4 8x - x^2 dx$ **M1 M1 (1 mark is for limits)**

$4x^2 - \frac{1}{3}x^3$ **M1**

$64 - \frac{64}{3} = \frac{128}{3}$ **M1**

" $\frac{128}{3}$ " + "32" OR SHOWS $\frac{224}{3}$ **A1**

10 a) 120° **B1**

b) $A=1, B=2, C=3$ **B1 B1 B1**

11. a) ATTEMPTS TO FIND y VALUES AT REGULAR INTERVALS **M1**

SHOW 4 OUT OF 1, 1.4142, 1.6325, 1.8226, 2 **A1**

$\frac{0.25}{2} [1+2 + 2(1.4142 + 1.6325 + 1.8226)]$ **M3**

A.W.R.T 1.59 **A1**

b) i) $1.59 + (3 \times 1)$ **M1**

4.59 **A1**

MUST CONSIDER

DO NOT ACCEPT JUST +3

ii) $2\sqrt{x} \times 2^3$ OR $8x$ **M1**

A.W.R.T 12.7 **A1**

FOR PART (b) DO NOT ACCEPT
RECALCULATION