1. $\boxed{1 - 20x} + \boxed{150x^2} \boxed{- 500x^3} + \boxed{625x^4}$ **B4**

---

2. a) $(-2)^3 + 4(-2)^2 + 7(-2) + k = 0$ **M1**

SIMPLIFIES EQUATION TO $-8 + 16 - 14 + k$

                a shows $\underline{k = 6}$ **A1**

b) $(x+2)(x^2 + bx + c)$ **M1**

$(x+2)(x^2 + 2x + 3)$ **A1**

---

3. $(1, 10)$ **B1**

$\boxed{\text{ATTEMPT}}$ to FIND $|MB|$ or $|MA|$ or $|AB|$, $\boxed{\begin{array}{c} r = 5 \\ \text{OR} \\ D = 10 \end{array}}$ **M1 A1**

$\boxed{(x-1)^2} \boxed{+ (y-10)^2} \boxed{= 25}$ **A3**

---

4. a) $8^2 = 6^2 + 6^2 - 2 \times 6 \times 6 \times \cos\theta$ **M1**

$\cos\theta = \frac{1}{9}$ **M1**

$1.459455...$ OR 1.46 **A1**

ALTERNATIVE

$\sin"\phi" = "\frac{2}{3}"$

$\phi = 0.72972...$

$\theta = 2 \times 0.72972 = 1.46^c$

b) $\frac{1}{2} \times 6^2 \times "1.46" = 26.27...$ **M1 A1**

$\frac{1}{2} \times 6 \times 6 \times \sin("1.46^c") = 17.89...$ **M1 A1**

       } follow from their "1.46"

shows 8.38 or 8.39 **A1 c.a.o**

5. a) $ar^2 = 54$ } **B1**

(or) $ar^5 = 1458$

$r^3 = 27$ **M1**

$r = 3$ **A1**

$a = 6$ **A1**

b)
$$\frac{"6"\left(1 - "3"^6\right)}{1 - "3"} \quad \textbf{M1}$$

177144 **A1 c.a.o**

---

6. a) <u>shows</u> 3.4641, 3, 3.4641, 4.5, 6.2354, 9 **A2**

(at least 2 d.p) -1 eeoo

$$\frac{0.5}{2}\left["3.4641" + "9" + 2\left(3 + 3.4641 + 4.5 + 6.2354\right)"\right] \quad \begin{matrix}\textbf{M1}\\\textbf{M1}\end{matrix}$$

$\simeq 11.7$ **A1 c.a.o**

b) INDICATES <u>MORE</u> STRIPS OR MORE TRAPEZIUMS   **B1**

c) INDICATES OVERESTIMATE & EXPLAINS "THAT TRAPEZIA GO OVER CURVE"

e.g

   B1

---

7. a)

(0,1)

B1 CORRECT SHAPE

B1 (0,1)

b) $3^a = 1.5$ o.E   **M1**

USE OF LOGS

e.g $a\log 3 = \log 1.5$ } **M1**
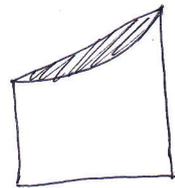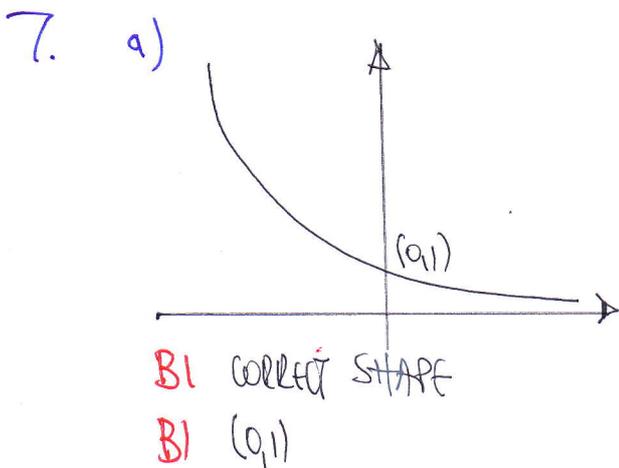
<u>OR</u> $\log_3 1.5$

0.369 **A1 c.a.o**

8. $2x^3 - 8x^2 + 6x$ A1

$\int_0^1 ax^3 + bx^2 + cx \, dx$ M2   ONE MARK FOR LIMITS
ONE MARK FOR THE REST

$\int_1^3 ax^3 + bx^2 + a \, dx.$ M1

$"\frac{1}{2}x^4 - \frac{8}{3}x^3 + 3x^2"$ M1

SIGHT OF $\frac{5}{6}$ A1

SIGHT OF $-\frac{16}{3}$ A1

AREA GIVEN AS $\frac{37}{6}$ O.E.   A1

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9. **a)** SIGHT OF $60°$ B1
SIGHT OF $120°$ B1

$15°$ A1
$-165°$ OR $195°$ A1
$45°$ A1
$-135°$ OR $225°$ A1

b) $\tan x = 2$ A1
SIGHT OF $63.4°...$ A1
SIGHT OF $243.4°$ A1

c) USE OF $(1 - \cos^2 y)$ B1

$2\cos^2 y + 5\cos y - 3$ A1

$(2\cos y - 1)(\cos y + 3)$ OR SIMILAR   M1

$\cos y = \frac{1}{2}$ A1

$\frac{\pi}{3}$ A1

$\frac{5\pi}{3}$ A1

10. **a)** ATTEMPT TO FIND SURFACE AREA   M1

$5x^2 + 6xh = 360$ ✳   A1

$V = 5x^2h$ #   A1

SUBSTITUTES ✳ INTO # & CONVINGLY

                      GETS THE ANSWER   A1

b) $300 - \dfrac{25}{2}x^2$ A1

THEIR "$\dfrac{dv}{dx}$" $= 0$ B1

SOLVE EQUATIONS   M1

GIVES $\sqrt{24}$ OR $4.90...$ A1

c) -300"$\times$"$\overset{\frown}{\sqrt{24}}$" $- \dfrac{25}{6}$"$\overset{\frown}{\sqrt{24}}$"   M1

a.w.r.t 980   A1

SIGHT OF $-25x$ M1

$-25\sqrt{24} < 0$ OR $-122.4 < 0$ A1

              + STATEMENT