HSC Mathematics 2003
Quick Answers

Disclaimer

These answers are intended as a quick guide only. To save space there are no proofs or diagrams. For greater detail please refer to fully worked solutions.

Question 1

(a) 0.0302

(b) $3+\sec^2 x$

(c) 95°

(d) \$280

(e) x^3-8x+c.

(f) $x=-4$ or $x=10$.

Question 2

(a) $ex+2y-\left(4+e^2\right)=0$

(b) (i) $\sqrt{2}$

(ii) -1

(iii) 135°

(iv) $x+y-10=0$, $(10,0)$

(vi) 35 units^2.

Question 3

(a) (i) $18e^x\left(2e^x-4\right)^8$

(ii) $x^2\cos x+2x\sin x$

(b) 89°.

(d) (i) $\ln\left(x^2+5\right)+c$

(ii) $\sqrt{3}-1$

Question 4

(a) (i) 55°.

(ii) 064°

(b) (i) $\frac{1}{6}$

(ii) $\frac{1}{2}$

(c) (i) $(1,-3)$

(ii) $4\frac{1}{2}$ units^2.

Question 5

(a) (ii) $(0,0)$ is a horizontal pt of inflexion
$(3,-27)$ is a minimum.

(iv) $0<x<2$.

(b) (i) 63

(ii) 73

(iii) 3738.

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Question 6

(a) $x = 12$.

(c) (i) $C_0 = 5$ and $k \approx 0.5798$.

(ii) 5.6

Question 7

(a) (i) $2 + \sqrt{2}$

(ii) Because the common ratio is $\dfrac{1}{\sqrt{2}-1}$ which is NOT between -1 and 1.

(b) (i) $t = \dfrac{\pi}{3}$ and $t = \dfrac{5\pi}{3}$ seconds.

(ii) 6 m/s.

(iv) $4\sqrt{3} + \dfrac{2\pi}{3}$ metres.

Question 8

(a) $y = 2$

(b) $\pi \int_1^5 (\ln y)^2 \, dy$.

(c) 11.9

(d) (ii) $m = \dfrac{2}{3}$ or $m = 1$

(iii) $x - y - 3 = 0$.

Question 9

(a) $x = \dfrac{7\pi}{6}$ or $x = \dfrac{11\pi}{6}$.

(b) (i) 30°

(ii) $\dfrac{\pi r^2}{2}$ units^2

(iii) $\dfrac{\pi r^2}{3}$ units^2

(iv) $r^2\left(\dfrac{\sqrt{3}}{2} - \dfrac{\pi}{6}\right)$ units^2.

(c) (ii) $v = \dfrac{3}{2}u$

Question 10

(a) (i)

$$A_2 = 120000\left(1 + \frac{0.06}{k}\right)^2 - F\left(1 + \frac{0.06}{k}\right) - F$$

(iii) \$2324.47

(iv) \$499

(b) (iii) $x = \dfrac{r^2 + r\sqrt{r^2+8}}{4}$.

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