HSC Mathematics Extension 1 2002
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) 3.

(b) $3x(1+2\ln x)$.

(c) $\frac{1}{2}$.

(d) Domain: $-2 \le x \le 2$

Range: $-\frac{3\pi}{2} \le y \le \frac{3\pi}{2}$.

(e) $2x^2 = 9y$.

(f) $\frac{5}{24}$.

Question 2

(a) 1.58

(b) $2\pi n \pm \frac{\pi}{6}$.

(c) $a = 19$.

(d) $\frac{\pi}{4}$.

Question 3

(a) (i) 720
(ii) 480

(b) (ii) 3.74

(c) (ii) $A = 58$ and $k = -\frac{1}{10}\ln\left(\frac{19}{29}\right) \approx 0.0423$.

(iii) 47 minutes.

Question 4

(a) (i) ${}^{10}C_9\left(\frac{2}{3}\right)^9\left(\frac{1}{3}\right)^1$

(ii) $1-\left[{}^{10}C_9\left(\frac{2}{3}\right)^9\left(\frac{1}{3}\right)^1+\left(\frac{2}{3}\right)^{10}\right]$

(b) (i) 2.
(ii) –24.
(iii) Third root is 2, $k = -12$.

(c) (ii) $\sqrt{2}$.

(iii) $x = \sqrt{2}\cos\left(4t-\frac{\pi}{4}\right)$.
(other equivalent answers possible)

Question 5

(b) (ii) $\frac{1}{3\pi}$ cm/s.

Question 6

(a) (ii) $V = \frac{15\sqrt{10}}{2}$.

(iii) Maximum height is 15.125 metres.

Question 7

(a) (iii) $y = \ln\left(\frac{x-\sqrt{x^2-4}}{2}\right)$.

(b) (ii) $\frac{1}{n+2}$.

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