HSC Mathematics 2004
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) $3 \cdot 4 \times 10^6$

(b) $4x^3 - 5x^{-2}$

(c) $x = 83.$

(d) $a = 11,\ b = 6.$

(e) $\dfrac{19}{30}$

(f) $-6 \le x \le 4.$

Question 2

(a) (i) $3\sqrt{2}$ units.

(ii) $-1.$

(iii) $45°.$

(vi) $x = 2.$

(vii) $(2,6).$

(b) $109°.$

(c) $-4 < k < 4.$

Question 3

(a) (i) $x + 2x \ln x.$

(ii) $5\cos x(1 + \sin x)^4.$

Question 3 (continued)

(b) (i) $\dfrac{1}{3}\left(e^6 - e^3\right).$

(ii) $\dfrac{1}{2}\ln\left(x^2 - 3\right) + c.$

(c) (i) 19.2 km.

(ii) $282°22'.$

Question 4

(a) 15π cm^2.

(b) (i) Maximum at $(0,0).$
Minimum at $(2,-4).$

(iii) $x > 1.$

(c) $4\pi\sqrt{3}$ units^3.

Question 5

(a) (i) 2 hours 10 minutes.

(ii) 28 hours.

(iii) During her 30th lesson.

(b) (i) 4 m to the right of O.

(iii) When $t = \dfrac{\pi}{2}$ and $x = -2.$

(iv) When $t = \dfrac{\pi}{4}$, speed = 6 m/s.

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Question 6

(a) $x = \ln 2$.

(b) (ii) $\angle YCM = 30°$.
$MY : AC = 1 : 2\sqrt{3}$.

(c) (i) $\frac{11}{36}$.

(ii) $\frac{1}{9}$.

(iii) $\frac{1291}{1296}$.

Question 7

(a) 29.

(b) (ii) $A = 17\,000\,000$.

(iii) $k \approx 0.0125$.

(iv) 2036.

(c) (i) \$357.20

(ii) \$55 716.71

Question 8

(a) (ii) $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$.

(b) (i) $y = -4$.

(ii) $x - 2y - 2 = 0$.

(iv) 18 units^2.

(v) 27 units^2.

Question 9

(a) (i) $\cos^2\theta$.

(ii) $-\frac{\pi}{4} < \theta < \frac{\pi}{4}$.

(b) (i) $t = 2$.

(ii) $t = 4$.

Question 10

(a) (i) $\frac{10}{9}$ units^2.

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