HSC Mathematics 2001
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) 1.33

(b) $-5 < x < -1$.

(c) $x = 4$ or $x = -2$

(d) $3x + \ln x + c$

(e) $\dfrac{3x+4}{(x-2)(x+2)}$

(f) \$890.

Question 2

(a) $5x - y - 1 = 0$

(b) (iii) $\dfrac{13}{\sqrt{10}}$

(iv) 26 units^2.

(v) $\dfrac{26\sqrt{29}}{29}$

Question 3

(a) $\ln\left(\dfrac{5}{4}\right)$

(b) $k = \dfrac{18600}{70^{\frac{2}{3}}} \approx 1095.08$

$S = \dfrac{18600}{70^{\frac{2}{3}}} \times 60^{\frac{2}{3}} \approx 16\,783 \text{ cm}^2$.

(c) (i) $\dfrac{2x}{x^2-9}$

(ii) $\dfrac{1-x}{e^x}$

(d) $x = 15$.

Question 4

(a) $k > \dfrac{1}{3}$.

(c) (iii) $\dfrac{192-\pi^2}{128}$

Question 5

(a) $-5 \le x \le 5$
$0 \le y \le 10$

(b) (i) 301.030
(ii) 302 digits

(c) 153 mm.

(d) (i) 12 m^2.

(ii) 21 600 m^3.

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Question 6

(a) (i) 294

(ii) 8790

(b) $\alpha \approx 0.207$

(c) (i) A is the pt $(-1,3)$ and B is $\left(\frac{1}{3},1\frac{22}{27}\right)$

(ii) $x > -\frac{1}{3}$

(iii) $1\frac{22}{27} < k < 3$

Question 7

(a) $\frac{64\pi}{3}$ units^3.

(b) (i) 0.1875

(ii) 0.015 625

(c) (i) $x = -1$

(ii) $v = \frac{4}{(t+2)^2}$ and $a = \frac{-8}{(t+2)^3}$

(iii) No because velocity is always > 0.

(iv) 0 m/s.

Question 8

(a) $N_0 = 18$, $k \approx 0.0803$, 9512 koalas.

(b) (i) $\frac{1}{5}$

(ii) $\frac{1}{120}$

(c) (i) $y_1 = 2$, $y_2 = 7$

Question 9

(b) (i) 4 L/hour

(ii) $V = 2e^t - 2e^{-t}$

(iv) 42 minutes.

Question 10

(a) (i) \$988

(iii) 14 more years.

(b) (i) Time for D to P = $\frac{5}{18}(8 + \tan\theta)$ min.

Time for F to P = $\frac{25}{24}\sec\theta$ min.

(ii) 8:01 am (and 13 seconds)

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