Year 12 3 unit Mathematics
Answers to 2001 Half-Yearly Examination

Question 1
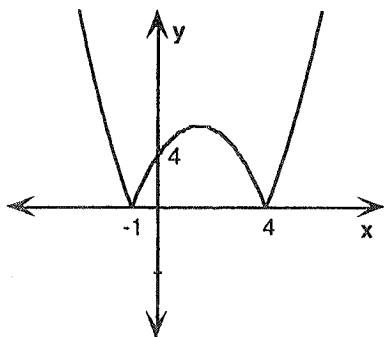
(a) (i) $2\sec^2 5x \tan 5x$

    (ii) $\dfrac{1}{x\ln 10}$

(b) $-\frac{7}{3}\ln(1-3x)+C$

(c) (i) $\frac{3}{4}$

    (ii) $\frac{1}{3}$

(d) $\ln\dfrac{e+1}{2}$

Question 2

(a) $x < 5$ and $x \geq 6$

(b) $\cos A$

(c) $y = \frac{1}{2}x^2 + \cos x + 1$
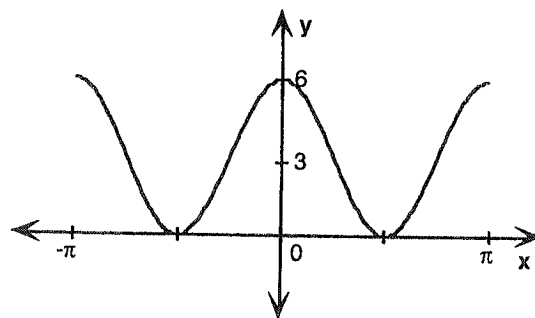
(d) $(-4, 8\frac{1}{2})$

Question 3

(a) $f^{-1}(x) = \frac{1}{2}x^{\frac{1}{3}}$

(b)

(c) 2 solutions

(d) $x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}$ or $\frac{17\pi}{12}$

Question 4

(a) (i) 1.5 m

    (ii) $\frac{3\pi}{16}$ square metres

(b) (i) Period: π
    Amplitude: 3
    Range: $0 \leq y \leq 6$

    (ii)

(c) $5\sqrt{2}$ square units

Question 5

(a) 81°52'

(b) $\frac{\pi}{2}(e^{10} - e^2)$

(c) (i) $Q_0 = 1$

    (ii) $k = 0.0866$

    (iii) 0.02166 units per minute

(d) $\frac{47}{66}$

Question 6

(b) $\frac{1}{3}$