Solving Algebraic Equations

1) $k = \frac{1}{4}$

2)a) $k = -5$ b) $x = -2, \frac{1}{2}, 1$

3)a) $x = \frac{1}{3}$ b) $(x - 2)(2x + 1)(x - 2)$ c) $A(-\frac{1}{2}, 0)$, $x < -\frac{1}{2}$

4) Show that $b^2 - 4ac \geq 0$

5)a) Carry out synthetic division and show that the remainder is 0.

5)b) $(x - 2)(2x + 3)(3x - 1)$

6)a) Carry out synthetic division and show that the remainder is 0.

b) $(x + 1)(x + 1)(x - 3)$ or $(x + 1)^2(x - 3)$

c) $(-1, 0)$ because of the repeated factor/root from (b) above.

7)a) $(x - 5)^2 + 2$ b) show that $g'(x) > 0$

8) show that $b^2 - 4ac \geq 0$

9)a) $(x - 3)(2x - 3)(x + 1)$ b) $(-1, 0)$ $(\frac{3}{2}, 0)$ $(3, 0)$

c) greatest = 9 least = -35

10)a) Sub into equation or carry out synthetic division and show that the remainder is 0.

b) $p \leq -1$ and $p \geq 3$

11)a) $2(x + 1)^2 - 5$ b) $(-1, -5)$

12) $k = 24$

13) $k < -\frac{1}{4}$

Solving Trigonometric Equations

1) $x = 90^0$, 199.5^0 & 340.5^0

2)a) $x = 30^0, 90^0$ & 150^0 b) $(150, \frac{-\sqrt{3}}{2})$

3)a) $y = 2\cos(2x)$ b) $B(\frac{7\pi}{12}, -\sqrt{3})$

4) 1.23 radians only

5) $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

6)a) $\sqrt{34}\cos(x - 59)^0$ b) $x = 12.3^0$

7) $x = 0^0, 60^0, 180^0, 300^0, 360^0$

8) $x = 90^0$ & 270^0

9)a) $a = 2$ $b = 3$ $c = -1$ b) $x_p = 50^0$

Differentiating Functions

1) $y = 2x - 12$

2) $y = \sqrt{3x + 1} - \frac{\pi}{\sqrt{3}}$

3) $\frac{3}{16}$

4) $6 - \sqrt{3}$

5) $3\cos(x) - 2\sin(2x)$

6)a) $x = 2$ b) $y = 12x - 8$

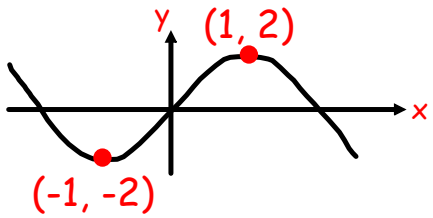
7) $y = -3x + 36$

8) Pt of inflection at $(\frac{1}{2}, 0)$

9) $-3x^{-4} + 2\sin 2x$

10)a) $(-\sqrt{3}, 0)\ (0, 0)\ (\sqrt{3}, 0)$ b) max TP at (1, 2) min TP at (-1, -2)

c)



11) $3x(3x^2 + 2)^{-\frac{1}{2}}$

Integrating Functions

1) $x^3 + 4x^{-1} + c$

2) $y = -\frac{3}{2}\cos(2x) + \frac{1}{4}\sqrt{3}$

3) $v = -\frac{4}{3}(4 - t)^{\frac{3}{2}} + \frac{32}{3}$

4) $2x^2 + x^{-1} + C$

5) $\frac{2}{3}$

6) $\frac{13}{3}$

7)a) $\frac{5}{4}$ sq units b) $\frac{9}{2}$ sq units

8) $y = 2x^2 - 2x^3 + 5$

9)a) $y = 0$ so $x = -1, 3, 2$ b) $A(2, 0)$ c) $\frac{22}{3}$ sq units

10) 0.36