

YEAR 12 OCT/NOV TEST

- 1) Solve the equation

$$8^{4x+1} = 4^{3x}$$

[5 MARKS]

- 2) Simplify

a) $\frac{4\sqrt{2} - \sqrt{11}}{3\sqrt{2} + \sqrt{11}}$

[5 MARKS]

b) $\frac{7}{2\sqrt{14}} + \left(\frac{\sqrt{14}}{2}\right)^3$

[5 MARKS]

- 3) Express $2x^2 - 4x + 1$ in the form $a(x+b)^2 + c$ where a , b and c need to be found.

Hence sketch the curve $y = 2x^2 - 4x + 1$ indicating the coordinates of its stationary point.

[7 MARKS]

- 4) a) Solve the simultaneous equations

$$\begin{aligned} y+3 &= x^2+2x \\ y+7 &= 6x \end{aligned}$$

- b) Interpret the answer in a) geometrically.

[6 MARKS]

- 5) a) Solve algebraically

$$x^2 - 2x - 15 > 0$$

[4 MARKS]

- b) Solve graphically

$$2x^2 + 5x - 3 < 0$$

[4 MARKS]

- 6) Show that the equation

$$x^2 + (2k-1)x + (k^2 - k + 1) = 0$$

has no real roots for any k value.

[4 MARKS]