



SPTA

Higher Homework

Quadratics (B)



1. (a) Express $x^2 - 4x + 7$ in the form $a(x + b)^2 + c$ (2)

(b) Write down the maximum possible value of $\frac{1}{x^2 - 4x + 7}$ (1)

2. Express $-3x^2 + 6x + 4$ in the form $a(x + b)^2 + c$ (3)

3. Solve $x^2 - 5x + 4 \geq 0$ (2)

4. What are the nature of the roots in the following quadratic equations

(a) $3x^2 - x + 4 = 0$ (b) $(x + 3)(x - 3) = 2x - 3$ (5)

5. Show that the line with equation $y = 1 - x$ is a tangent to the parabola $y = x^2 - 3x + 2$ and state the coordinates of the point of contact. (5)

6. If p and q are real, show that the following equation always has real roots

$$x^2 + (q - p)x - pq$$
 (4)

7. The line $y = mx + 8$ is a tangent to $y = x^2 + 9$. Find two values for m . (3)