Solving Quadratic Inequalities

Things to remember:

- Start by solving the quadratic to find the values of x, then sketch the graph to determine the inequality.

Questions:

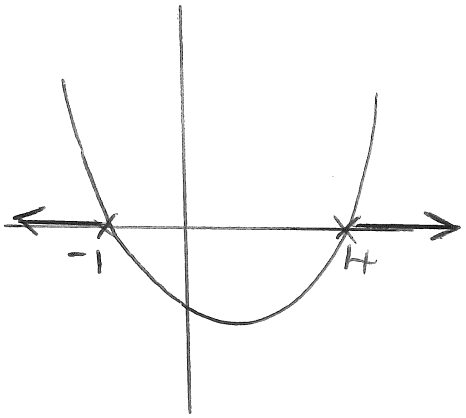
1. Solve $x^2 > 3x + 4$

let $x^2 = 3x + 4$

$x^2 - 3x - 4 = 0$

$(x - 4)(x + 1) = 0$

$x = 4, x = -1$



$x^2 > 3x + 4$

$x^2 - 3x - 4 > 0$

so $x > 4$ or $x < -1$.

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(Total for question = 3 marks)

2. Solve the inequality $x^2 \geq 3(x + 6)$

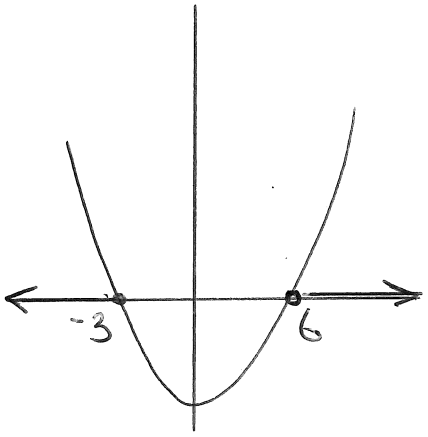
$x^2 - 3(x + 6) \geq 0$

$x^2 - 3x - 18 \geq 0$

$(x - 6)(x + 3) \geq 0$

When $(x - 6)(x + 3) = 0$

$x = 6, x = -3$



so $x \geq 6$ or $x \leq -3$

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(Total for question = 4 marks)

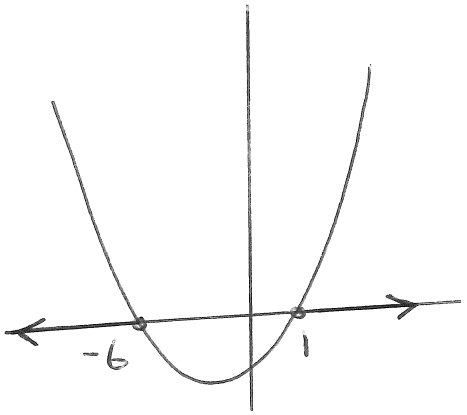
3. Solve the inequality $x^2 + 5x > 6$

$x^2 + 5x - 6 > 0$

$(x+6)(x-1) > 0$

When $(x+6)(x-1) = 0$

$x = -6, \; x = 1.$



so $x < -6$

or $x > 1$

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(Total for question = 3 marks)

4. Solve the inequality $x^2 - 2x - 8 < 0$

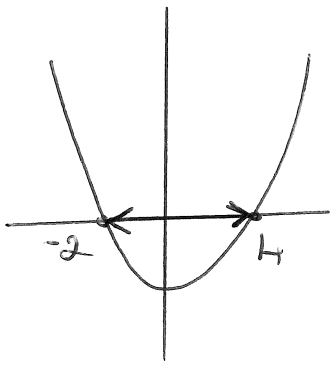
$(x-4)(x+2) < 0$

When $(x-4)(x+2) = 0$

$x = 4, \; x = -2$

Curve is below the x-axis

When $-2 < x < 4$



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(Total for question = 3 marks)