Sketch the following graphs, indicating clearly where the roots are.

*y = x*2 – 2*x* – 8



 *y = x*2 + 6*x* + 5



 *y = x*2 + 18*x* + 65



*y =* – *x*2 + 2*x* + 8



 *y = x*2– 9

Quadratic Inequalities

Example 1: Solve the inequality

$$x^{2} – 2x – 8 > 0$$

Step 1: Find the roots of the equation



Step 2: Sketch the Graph

Step 3: Shade the part of the graph that satisfies the inequality

Step 4: Think about the graph ‘squashed down’

Step 5: Describe the inequality.

Step 6: Check some points to ensure they work in the original inequality

Example 2: Solve the inequality

$$x^{2} – 2x – 8 \leq 0$$

Step 1: Find the roots of the equation



Step 2: Sketch the Graph

Step 3: Shade the part of the graph that satisfies the inequality

Step 4: Think about the graph ‘squashed down’

Step 5: Describe the inequality.

Step 6: Check some points to ensure they work in the original inequality

**Quadratic Inequalities: Worksheet**

Q1 $x^{2}-9>$0

$\left(x+3\right)\left(x-3\right)> 0$

$$ x=-3 or x=3$$



-3

3

Q2 $x^{2}+ 6x + 5 \leq 0$

$\left(x+1\right)\left(x+5\right)\leq 0$

$ x=-1 or x=-5$

-5

-1

Q3 $x^{2}+ 18x + 65 \geq 0$

$\left(x+13\right)\left(x+5\right)\leq 0$



Q4 $x^{2}+ 6x- 7< 0$

$\left(x+7\right)\left(x-1\right)\leq 0$



Q5 $x^{2}+4x-21> 0$



Q6 $x^{2}- 10x + 16 \leq 0$

Q7 $x^{2}- 2x- 63 \geq 0$

Q8 $x^{2}+x- 20< 0$

Q9 $-x^{2}+ 14x- 40 \geq 0$

Hint: try to make *x*2 positive first

Q10 $2x^{2}- 6x- 56< 0$

Hint: divide by 2 first to make

the inequality simpler

Q11 $5x^{2}\geq - 55x- 120 $

Hint: group all terms on the

same side first

Q12 $3x^{2}+ 14x- 5> 0$

Hint: 3 and 5 are prime so have limited factors