

Name: \_\_\_\_\_

## GCSE (1 – 9)

# Quadratic Inequalities

### Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

### Information

- The marks for each question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

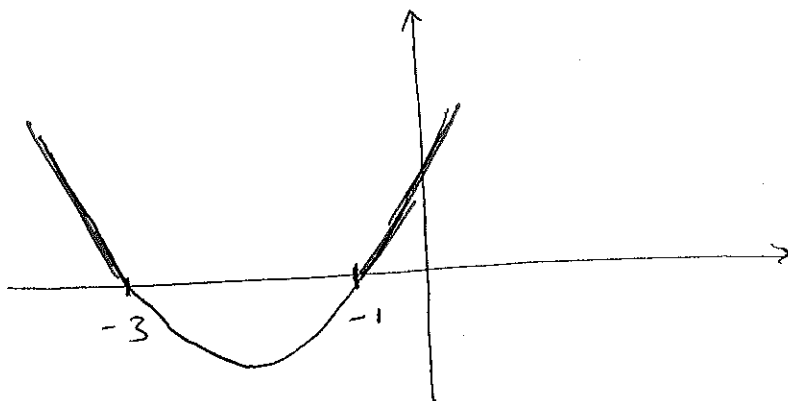
### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1. Solve  $x^2 + 4x + 3 > 0$

$$(x + 3)(x + 1) > 0$$

Crosses y axis at:  $x = -3$   $x = -1$



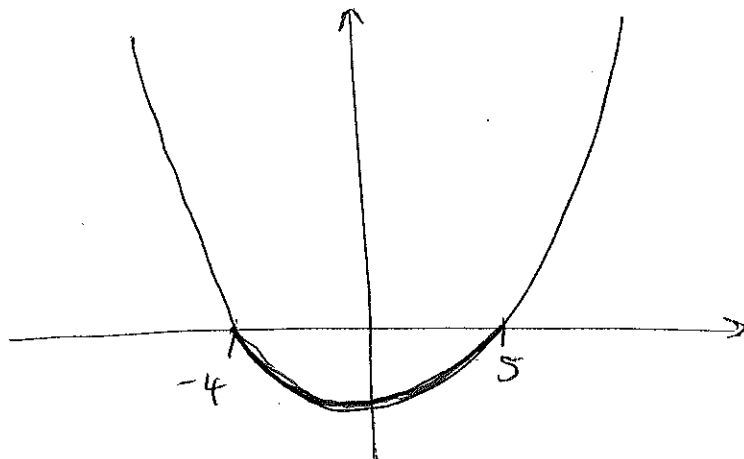
Bigger than zero  
Above Ground

$$x < -3 \text{ or } x > -1 \quad (3)$$

2. Solve  $x^2 - x - 20 < 0$

$$(x + 4)(x - 5) < 0$$

Crosses y axis at:  $x = -4$   $x = 5$



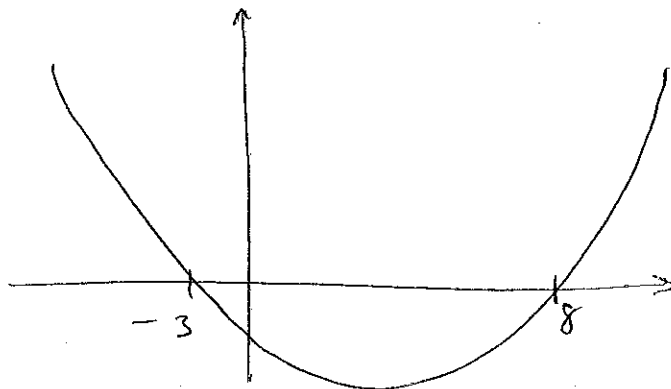
Less than zero  
below ground

$$-4 < x < 5 \quad (3)$$

3. Solve  $x^2 - 5x - 24 > 0$

$$(x - 8)(x + 3) > 0$$

$$x = 8 \quad x = -3$$



$$x < -3 \text{ or } x > 8 \quad (3)$$

4. Solve  $x^2 - 12x + 35 < 0$

$$(x - 7)(x - 5) < 0$$

$$x = 7 \quad x = 5$$

$$5 < x < 7 \quad (3)$$

5. Solve  $x^2 - 7x + 12 \leq 0$

$$(x - 3)(x - 4) \leq 0$$

$$x = 3 \quad x = 4$$

$$\underline{3 \leq x \leq 4} \quad (3)$$

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6. Solve  $x^2 + 2x - 35 \geq 0$

$$(x + 7)(x - 5) \geq 0$$

$$x = -7 \quad x = 5$$

$$\underline{x \leq -7 \text{ or } x \geq 5} \quad (3)$$

7. Solve  $x^2 \leq 100$

$$x^2 - 100 \leq 0$$

$$(x+10)(x-10) \leq 0$$

$$x = -10 \quad x = 10$$

$$-10 \leq x \leq 10 \quad (4)$$

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8. Solve  $x^2 - 49 > 0$

$$(x+7)(x-7) > 0$$

$$x = -7 \quad x = 7$$

$$x < -7 \text{ or } x > 7 \quad (4)$$

9. Solve  $x^2 > 8x + 9$

$$x^2 - 8x - 9 > 0$$

$$(x - 9)(x + 1) > 0$$

$$x = 9 \quad x = -1$$

$$x < -1 \text{ or } x > 9 \quad (4)$$

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10. Solve  $6x^2 + 11x - 10 < 0$

$$(3x - 2)(2x + 5) < 0$$

$$x = 2/3 \quad x = -2.5$$

$$-2.5 < x < 2/3$$

$$\cancel{2/3 < x} \dots \dots \dots (4)$$

11. Solve  $6x + 27 > x^2$

$$0 > x^2 - 6x - 27$$

$$0 > (x - 9)(x + 3)$$

$$x = 9 \quad x = -3$$

$$\dots\dots\dots -3 < x < 9 \quad (4)$$

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12. Solve  $2x^2 - 11x + 9 < 0$

$$(2x - 9)(x - 1) < 0$$

$$x = 4.5 \quad x = 1$$

$$\dots\dots\dots 1 < x < 4.5 \quad (4)$$

13. Work out the integer values that satisfy:

$$2x^2 - 10x + 10 < 0$$

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

$$a=1 \quad b=-5 \quad c=5$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(5)}}{2(1)}$$

$$x = 3.62 \text{ (2dp)} \quad x = 1.38 \text{ (2dp)}$$

...2 and 3... (4)

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14. Work out the integer values that satisfy:

$$x^2 - 7x + 11 < 0$$

$$a=1 \quad b=-7 \quad c=11$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(11)}}{2(1)}$$

$$x = 4.62 \text{ (2dp)} \quad x = 2.38 \text{ (2dp)}$$

...3 and 4... (4)