

## Task 1 – Solve the following inequalities.

- 1)  $x^2 + x - 6 > 0$
- 2)  $x^2 + x - 20 \leq 0$
- 3)  $x^2 - 11x + 24 < 0$
- 4)  $x^2 + 10x + 9 \geq 0$
- 5)  $x^2 - 25 < 0$
- 6)  $x^2 - 4 > 0$
- 7)  $2x^2 + x - 3 \geq 0$
- 8)  $3x^2 - 11x - 4 < 0$
- 9)  $5x^2 + 17x + 6 < 0$
- 10)  $4x^2 + 8x + 3 > 0$
- 11)  $5x^2 + 13x + 6 \leq 0$
- 12)  $x^2 + 4x - 21 \geq x + 7$
- 13)  $x^2 - 8x + 10 \leq -2x + 37$
- 14)  $2x^2 - 2x - 1 \geq -x^2 - x + 5$
- 15)  $x^2 - 3x - 64 < -3x$
- 16)  $4x^2 - 17 < -8$
- 17)  $x^2 + 2x + 4 > 4$

## Challenge

18) A rectangle has a width of  $x$  cm and a length of  $(x - 3)$  cm. The area of the rectangle must be at least 40 cm. Given that  $x > 3$ , form an algebraic inequality and solve for the possible values of  $x$ .

19) A ball is thrown upward, and its height, in metres, after  $t$  seconds is given by:

$$h(t) = -t^2 + 6t$$

For which values of  $t$ , is the ball above 5 metres?

20) A company's profit, in thousands of pounds, is given by:

$$P(x) = -3x^2 + 7x - 1$$

The company wants the profit to be positive.

For what values of  $x$  is  $P(x) > 0$ ?

Give your answers as exact values.