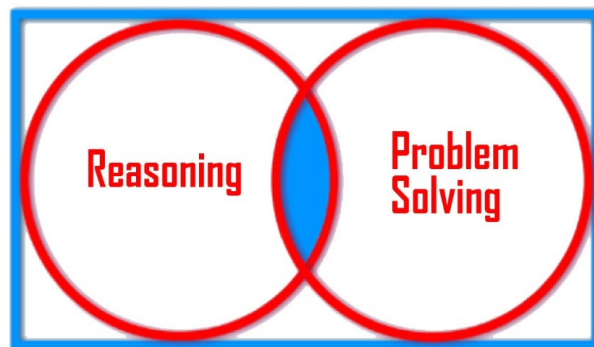


# Bridging the Gap

**GCSE to A – Level Transition**



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**Quadratic Equations and Inequalities**  
**Answers**

**1** Solve the following quadratic equations

- a)  $x^2 + 5x - 36 = 0$
- b)  $5x^2 - 15x = 0$
- c)  $x^2 = 12 - x$
- d)  $x^2 + 2x = 15x - 42$
- e)  $17x + 72 = -x^2$
- f)  $x(x + 11) = 60$

**Answers**

- a)  $x = -9$  or  $x = 4$
- b)  $x = 0$  or  $x = 3$
- c)  $x = 3$  or  $x = -4$
- d)  $x = 6$  or  $x = 7$
- e)  $x = -9$  or  $x = -8$
- f)  $x = -15$  or  $x = 4$

**2** Solve the following quadratic inequalities.

Show your answers on a number line

- a)  $x^2 + 3x - 4 \leq 0$
- b)  $x^2 - x > 0$
- c)  $x^2 - 10x - 11 < 0$
- d)  $x^2 + x \leq x + 81$
- e)  $x^2 \geq 4(3 - x)$

**Answers**

- a)  $-4 \leq x \leq 1$
- b)  $x < 0$ ;  $x > 1$
- c)  $-1 < x < 11$
- d)  $-9 \leq x \leq 9$
- e)  $x \leq -6$ ;  $x \geq 2$

**3** a) Given that  $6x^2 - 11x - 35 \equiv (3x + C)(2x + D)$

find the values of C and D

b) Hence or otherwise solve the equation  $(3x + C)(2x + D) = 0$

**Answer:**

- a)  $C = 5$  and  $D = -7$
- b)  $x = \frac{7}{2}$  or  $x = -\frac{5}{3}$

**4** Write the following equations in the form  $(x + p)^2 + q = 0$   
Where  $p$  and  $q$  are constants.  
Hence find the exact solutions to each equation

a)  $x^2 + 8x - 10 = 0$

b)  $5x^2 + 11x - 3 = 0$

**Answers**

a)  $(x + 4)^2 - 26 = 0$

$x = -4 \pm \sqrt{26}$

b)  $\left(x + \frac{11}{10}\right)^2 - \frac{181}{100} = 0$

$x = -\frac{11}{10} \pm \sqrt{\frac{181}{100}}$

**or**

$x = \frac{-11 \pm \sqrt{181}}{10}$

**5** Given that  $y = 3x^2 - 18x + 7$

a) Write  $y$  in the form  $(x + p)^2 + q$  where  $p$  and  $q$  are constants

b) Write  $y$  in the form  $A(x + p)^2 + q$   
where  $A$ ,  $p$  and  $q$  are constants to be found

c) Hence or otherwise solve the equation  $3x^2 - 18x + 7 = 0$   
Give your answers to 3 significant figures

**Answers**

a)  $y = (x - 3)^2 - \frac{20}{3}$

b)  $y = 3(x - 3)^2 - 20$

c)  $x = 5.58$  or  $x = 0.418$