



Note: A link to the associated YouTube tutorial can be found at [ALevelMathsRevision.com/bridging-the-gap/](https://www.youtube.com/watch?v=bridging-the-gap)

**Section 1: Routine Factorisation Practice**

**Easy**

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|--------------------|--------------------|--------------------|---------------------|
| 1. $a^2 - 6a + 8$  | 6. $a^2 - 7a + 12$ | 11. $a^2 - 2a + 1$ | 16. $a^2 - 9a + 20$ |
| 2. $a^2 + 7a + 10$ | 7. $a^2 + 2a - 8$  | 12. $a^2 - 5a + 4$ | 17. $a^2 - a - 12$  |
| 3. $a^2 - 3a + 2$  | 8. $a^2 + 8a + 15$ | 13. $a^2 - 2a - 3$ | 18. $a^2 + 9a + 20$ |
| 4. $a^2 - 5a + 4$  | 9. $a^2 + 5a + 6$  | 14. $a^2 + 6a + 8$ | 19. $a^2 - 3a - 10$ |
| 5. $a^2 + a - 2$   | 10. $a^2 + 6a + 9$ | 15. $a^2 + a - 20$ | 20. $a^2 - 2a - 8$  |

**Harder**

- |                      |                     |                      |                       |
|----------------------|---------------------|----------------------|-----------------------|
| 1. $3a^2 + 7a + 4$   | 6. $4a^2 - 15a + 9$ | 11. $4a^2 - 5a - 6$  | 16. $3a^2 - 2a - 5$   |
| 2. $4a^2 - 15a + 9$  | 7. $4a^2 - 15a - 4$ | 12. $2a^2 - 7a + 6$  | 17. $4a^2 - 17a + 4$  |
| 3. $3a^2 + a - 2$    | 8. $5a^2 + 14a - 3$ | 13. $3a^2 + 4a - 15$ | 18. $3a^2 + 13a - 10$ |
| 4. $4a^2 - 17a - 15$ | 9. $3a^2 + 4a - 4$  | 14. $3a^2 + 5a + 2$  | 19. $2a^2 - 9a + 9$   |
| 5. $2a^2 - 13a + 20$ | 10. $5a^2 - 6a - 8$ | 15. $3a^2 + 2a - 8$  | 20. $3a^2 - 7a - 6$   |

**Section 2: Problem Solving**

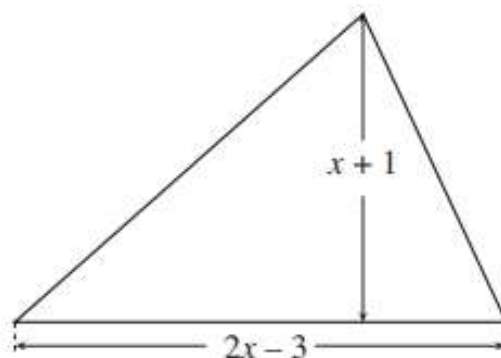
**Q1, (Jan 2007, Q9ii)**

Factorise  $x^2 - 4$  and  $x^2 - 5x + 6$ .

Hence express  $\frac{x^2 - 4}{x^2 - 5x + 6}$  as a fraction in its simplest form. [3]

**Q2, (Jun 2007, Q10)**

The triangle shown in Fig. 10 has height  $(x + 1)$  cm and base  $(2x - 3)$  cm. Its area is  $9 \text{ cm}^2$ .



**Not to scale**

**Fig. 10**

(i) Show that  $2x^2 - x - 21 = 0$ . [2]

(ii) By factorising, solve the equation  $2x^2 - x - 21 = 0$ . Hence find the height and base of the triangle. [3]

**Q3, (Jan 2008, Q2)**

Factorise and hence simplify  $\frac{3x^2 - 7x + 4}{x^2 - 1}$ . [3]

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**Q4, (Jun 2008, Q3i)**

Solve the equation  $2x^2 + 3x = 0$ . [2]

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**Q5, (Jun 2008, Q9)**

Solve the equation  $y^2 - 7y + 12 = 0$ .

Hence solve the equation  $x^4 - 7x^2 + 12 = 0$ . [4]

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**Q6, (Jun 2010, Q10i, ii)**

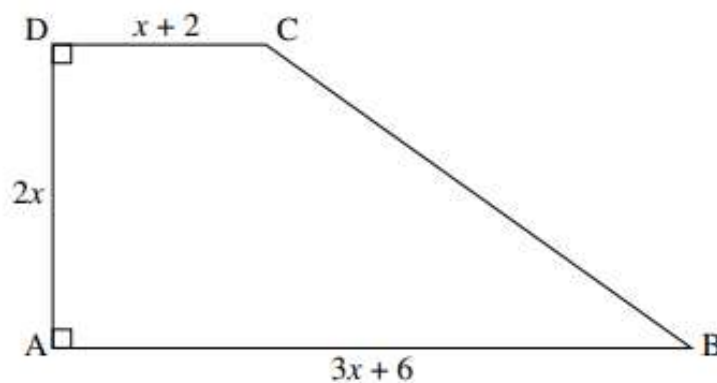
(i) Solve, by factorising, the equation  $2x^2 - x - 3 = 0$ . [3]

(ii) Sketch the graph of  $y = 2x^2 - x - 3$ . [3]

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**Q7, (Jan 2011, Q9)**

Fig. 9 shows a trapezium ABCD, with the lengths in centimetres of three of its sides.



**Fig. 9**

This trapezium has area  $140 \text{ cm}^2$ .

(i) Show that  $x^2 + 2x - 35 = 0$ . [2]

(ii) Hence find the length of side AB of the trapezium. [3]

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**Q8, (Jun 2012, Q4)**

Factorise and hence simplify the following expression.

$$\frac{x^2 - 9}{x^2 + 5x + 6} \quad [3]$$


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