



4.8H Expanding and Factorising: Higher Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 75 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Expand and simplify: $3(x + 4)$.

(Total for Question 1 is 2 marks)

2 Expand and simplify: $(2x - 5)(x + 3)$.

(Total for Question 2 is 2 marks)

3 Factorise fully: $6y + 15$.

(Total for Question 3 is 2 marks)

4 Factorise fully: $x^2 + 5x + 6$.

(Total for Question 4 is 3 marks)

- 5 Expand and simplify. Give your answer in the form $ax^2 + bx + c$.
 $0.5x(x - 6) + x(2x + 1)$

(Total for Question 5 is 3 marks)

- 6 Factorise by grouping: $3x^2 + 6x - 2x - 4$.

(Total for Question 6 is 4 marks)

- 7 Show that $(x + 4)(2x - 1) = 2x^2 + 7x - 4$. You must show your steps.

(Total for Question 7 is 3 marks)

- 8 Factorise fully: $4x^2 + 7x - 15$.

(Total for Question 8 is 5 marks)

9 A rectangle has length $(3x + 2)$ cm and width $(x - 4)$ cm. The area is given by $A = (3x + 2)(x - 4)$.

(a) Expand and simplify A in the form $ax^2 + bx + c$. (3 marks)

(b) Hence factorise the expression from part (a) and use your factorised form to work out the value of the expression when $x = 6$. (2 marks)

(a) Expand and simplify A in the form $ax^2 + bx + c$. (3)

(b) Hence factorise the expression from part (a) and use your factorised form to work out the value of the expression when $x = 6$. (2)

(Total for Question 9 is 5 marks)

10 Completely factorise: $x^3 + 2x^2 - 9x - 18$.

(Total for Question 10 is 6 marks)

Mark scheme · 4.8H Expanding and Factorising: Higher Tier Practice

Question 1

- **M1** multiply 3 by each term in the bracket, e.g. $3x + 12$ or equivalent method
- **A1** $3x + 12$ cao
- **Answer:** $3x + 12$

Question 2

- **M1** multiply out brackets correctly, e.g. $2x \cdot x$, $2x \cdot 3$, $-5 \cdot x$, $-5 \cdot 3$
- **A1** $2x^2 + x - 15$ cao
- **Answer:** $2x^2 + x - 15$

Question 3

- **M1** identify highest common factor 3 (or show grouping) and divide each term
- **A1** $3(2y + 5)$ cao
- **Answer:** $3(2y + 5)$

Question 4

- **M1** identify two numbers that multiply to 6 and add to 5 (2 and 3) or equivalent method
- **M1** write factors $(x + 2)(x + 3)$ or show splitting the middle term
- **A1** $(x + 2)(x + 3)$ cao
- **Answer:** $(x + 2)(x + 3)$

Question 5

- **M1** expand $0.5x(x - 6)$ to $0.5x^2 - 3x$ and expand $x(2x + 1)$ to $2x^2 + x$
- **M1** combine like terms correctly
- **A1** $2.5x^2 - 2x + 0$ cao
- **Answer:** $2.5x^2 - 2x$

Question 6

- **M1** group first two and last two terms: $(3x^2 + 6x) + (-2x - 4)$
- **M1** factor common factors from each group: $3x(x + 2) - 2(x + 2)$
- **A1** $(x + 2)$ as common factor identified
- **A1** $(x + 2)(3x - 2)$ cao
- **Answer:** $(x + 2)(3x - 2)$

Question 7

- **C1** expand brackets correctly: $x \cdot 2x$, $x \cdot (-1)$, $4 \cdot 2x$, $4 \cdot (-1)$ shown
- **C1** combine the four terms to form $2x^2 + 7x - 4$
- **C1** final statement equal to $2x^2 + 7x - 4$ with clear workings (cso)
- **Answer:** $2x^2 + 7x - 4$

Question 8

- **M1** multiply $4 \cdot -15 = -60$ and look for pair summing to 7
- **M1** find pair 12 and -5 that give -60 and sum 7
- **M1** split middle term and factor by grouping
- **A1** $(4x - 5)(x + 3)$ cao
- **A1** final factorisation shown correctly
- **Answer:** $(4x - 5)(x + 3)$

Question 9

- (a) **M1** multiply out brackets: $3x \cdot x$, $3x \cdot (-4)$, $2 \cdot x$, $2 \cdot (-4)$
- (a) **M1** combine like terms correctly
- (a) **A1** $3x^2 - 10x - 8$ cao
- (a) **Answer: $3x^2 - 10x - 8$**
- (b) **M1** factorise $3x^2 - 10x - 8$ to $(3x + 2)(x - 4)$ or equivalent
- (b) **A1** substitute $x = 6$ into the factorised form: $(3 \cdot 6 + 2)(6 - 4) = 20 \cdot 2 = 40$ cao
- (b) **Answer: Factorised form $(3x + 2)(x - 4)$; when $x = 6$ the expression equals 40**

Question 10

- **M1** attempt factorisation by grouping or test integer roots (e.g. $x = -3$) to find a linear factor
- **M1** divide polynomial by $(x + 3)$ or use grouping to obtain quadratic $x^2 - x - 6$
- **M1** factor quadratic $x^2 - x - 6$ into $(x + 2)(x - 3)$
- **A1** state intermediate factorisation $(x + 3)(x^2 - x - 6)$ cao
- **A1** complete factorisation $(x + 3)(x + 2)(x - 3)$ cao
- **A1** final answer fully factorised cao
- **Answer: $(x + 3)(x + 2)(x - 3)$**