



KS3.M-A9 Factorising into Single Brackets

AQA KS3.M-A9 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Write down the greatest common factor for each pair of numbers.

(a) GCF of 18 and 30 (1)

(b) GCF of 14 and 35 (1)

(c) GCF of 24 and 40 (1)

2 Factorise each integer by taking out the greatest common factor.

(a) Factorise $28 + 70$ (1)

(b) Factorise $45 - 15$ (1)

3 Factorise each algebraic expression by taking out the common factor.

(a) Factorise $6x + 15x$ (1)

(b) Factorise $4y - 10y$ (1)

(c) Factorise $9a + 6b$ (1)

4 Factorise each expression by taking out the highest numeric factor.

(a) Factorise $63p + 21q$ (1)

(b) Factorise $50m - 20n$ (1)

5 Factorise each expression fully, taking out common algebraic factors.

(a) Factorise $12x^2 + 18x$ (1)

(b) Factorise $7x - 21x^2$ (1)

(c) Factorise $15y^2 - 10y$ (1)

6 Factorise each expression where one term is negative.

(a) Factorise $-6x + 18$ (1)

(b) Factorise $8 - 12p$ (1)

7 Factorise each expression completely. Show any common algebraic factors taken out.

(a) Factorise $18x^2 - 24x$ (2)

(b) Factorise $14ab - 21a$ (2)

8 Factorise each expression where every term has a number and a letter in common.

(a) Factorise $21mn + 14m$ (1)

(b) Factorise $30xy - 10y$ (1)

9 Factorise each expression and then check by expanding your answer.

(a) Factorise $16x + 24$ and expand your factorised form to check (3)

10 Factorise each expression where the coefficients are small primes.

(a) Factorise $5x + 15$ (1)

(b) Factorise $11y - 33$ (1)

11 Apply factorising to simplify an expression used in a context.

(a) A recipe needs $12ab + 6b$ grams of an ingredient. Factorise to write the amount as a product. (3)

12 Factorise each pair where one term has a squared letter and the other does not.

(a) Factorise $x^2 + 5x$ (1)

(b) Factorise $6z^2 - 12z$ (1)

13 Factorise each expression with three terms where a single common factor exists.

(a) Factorise $9x + 3y + 6$ (2)

(b) Factorise $12a - 8b + 4c$ (2)

14 Factorise each expression then give the sign of the bracket so that the expression inside is positive where possible.

(a) Factorise $-15p + 5$ and give factor with positive bracket (3)

15 Solve each equation by factorising. Show your steps.

(a) Solve $6x - 18 = 0$ (4)

16 Factorise each expression that includes a decimal coefficient.

(a) Factorise $0.6x + 1.8$ (1)

(b) Factorise $2.5y - 7.5$ (1)

17 A school buys 18 identical packs and 24 identical rulers. The total cost is $18p + 24r$. Factorise the total cost to show the cost of one set containing a pack and a ruler.

- (a) Write the total cost $18p + 24r$ as a product showing the cost of one pack and one ruler. (3)

18 Stretch: Factorise fully and then indicate whether the bracket contains only positive terms. Explain how you know.

- (a) Factorise $-12k + 8 - 16k$ and say whether the bracket has only positive terms. (3)

Mark scheme · KS3.M-A9 Factorising into Single Brackets

Question 1

- (a) **B1** 6 cao
- (a) Answer: **6**
- (b) **B1** 7 cao
- (b) Answer: **7**
- (c) **B1** 8 cao
- (c) Answer: **8**

Question 2

- (a) **B1** $2(14 + 35)$ or $14(2 + 5)$ oe
- (a) Answer: **$14(2 + 5)$**
- (b) **B1** $15(3 - 1)$ oe
- (b) Answer: **$15(3 - 1)$**

Question 3

- (a) **B1** $3x(2 + 5)$ or $3x(7)$ not required but factor form $3x(2+5)$ oe
- (a) Answer: **$3x(2 + 5)$**
- (b) **B1** $2y(2 - 5)$ oe
- (b) Answer: **$2y(2 - 5)$**
- (c) **B1** $3(3a + 2b)$ oe
- (c) Answer: **$3(3a + 2b)$**

Question 4

- (a) **B1** $21(3p + q)$ cao
- (a) Answer: **$21(3p + q)$**
- (b) **B1** $10(5m - 2n)$ cao
- (b) Answer: **$10(5m - 2n)$**

Question 5

- (a) **B1** $6x(2x + 3)$ cao
- (a) Answer: **$6x(2x + 3)$**
- (b) **B1** $7x(1 - 3x)$ oe
- (b) Answer: **$7x(1 - 3x)$**
- (c) **B1** $5y(3y - 2)$ cao
- (c) Answer: **$5y(3y - 2)$**

Question 6

- (a) **B1** $-6(x - 3)$ or $6(-x + 3)$ oe
- (a) Answer: **$-6(x - 3)$**
- (b) **B1** $4(2 - 3p)$ cao
- (b) Answer: **$4(2 - 3p)$**

Question 7

- (a) **M1** method: factor common number and x, e.g. $6x$ taken out
- (a) **A1** $6x(3x - 4)$ cao
- (a) Answer: **$6x(3x - 4)$**
- (b) **M1** method: take out $7a$
- (b) **A1** $7a(2b - 3)$ cao
- (b) Answer: **$7a(2b - 3)$**

Question 8

- (a) **B1** $7m(3n + 2)$ cao
- (a) Answer: **$7m(3n + 2)$**
- (b) **B1** $10y(3x - 1)$ cao
- (b) Answer: **$10y(3x - 1)$**

Question 9

- (a) **M1** factor method, take out 8
- (a) **M1** correct factorised form $8(2x + 3)$
- (a) **A1** expansion $16x + 24$ cao
- (a) Answer: **$8(2x + 3)$**

Question 10

- (a) **B1** $5(x + 3)$ cao
- (a) Answer: **$5(x + 3)$**
- (b) **B1** $11(y - 3)$ cao
- (b) Answer: **$11(y - 3)$**

Question 11

- (a) **M1** identify common factor $6b$
- (a) **M1** write factorised form $6b(2a + 1)$
- (a) **A1** final answer $6b(2a + 1)$ cao
- (a) Answer: **$6b(2a + 1)$**

Question 12

- (a) **B1** $x(x + 5)$ cao
- (a) Answer: **$x(x + 5)$**
- (b) **B1** $6z(z - 2)$ cao
- (b) Answer: **$6z(z - 2)$**

Question 13

- (a) **M1** identify GCF 3
- (a) **A1** $3(3x + y + 2)$ cao
- (a) Answer: **$3(3x + y + 2)$**
- (b) **M1** identify GCF 4
- (b) **A1** $4(3a - 2b + c)$ cao
- (b) Answer: **$4(3a - 2b + c)$**

Question 14

- (a) **M1** take out -5 or 5 and change signs correctly
- (a) **M1** write factor form $-5(3p - 1)$ or $5(-3p + 1)$ method
- (a) **A1** $-5(3p - 1)$ cao
- (a) Answer: **$-5(3p - 1)$**

Question 15

- (a) **M1** factor out 6 to give $6(x - 3) = 0$
- (a) **M1** use zero product principle or divide both sides by 6
- (a) **M1** isolate x showing $x - 3 = 0$
- (a) **A1** $x = 3$ cao
- (a) Answer: **3**

Question 16

- (a) **B1** $0.6(x + 3)$ oe
- (a) Answer: **$0.6(x + 3)$**
- (b) **B1** $2.5(y - 3)$ cao
- (b) Answer: **$2.5(y - 3)$**

Question 17

- (a) **M1** identify common factor 6
- (a) **M1** write $6(3p + 4r)$
- (a) **A1** $6(3p + 4r)$ cao
- (a) Answer: **$6(3p + 4r)$**

Question 18

- (a) **M1** correct factor taken out, e.g. -4
- (a) **M1** correct factorised form $-4(3k - 2 + 4k)$ or simplified $-4(7k - 2)$
- (a) **A1** state that the bracket $7k - 2$ is not all positive for small k and explain oe
- (a) Answer: **$-4(7k - 2)$**