



KS3.M-A13 Expanding Double Brackets

AQA KS3.M-A13 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Expand each pair of brackets. Write your answer in fully simplified form.

(a) Expand $(x + 3)(x + 5)$. (1)

(b) Expand $(2x - 1)(x + 4)$. (1)

(c) Expand $(x - 2)(x - 6)$. (1)

(d) Expand $(3x + 2)(x - 5)$. (1)

2 Expand and simplify: $(x + 7)(x - 2)$.

(sing(2)+ 7)(x - 2) (3)

3 Expand and simplify: $(2x + 3)(2x - 1)$.

(sing(2)+ 3)(2x - 1) (3)

4 Square the binomial and simplify: $(x + 6)^2$.
 $(x + 6)^2$ (4)

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

6 Expand and simplify: $(x + 4)(2x + 5)$.
 $(x + 4)(2x + 5)$ (4)

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

8 Expand and simplify: $(4x + 1)(x - 2)$.
 $(4x + 1)(x - 2)$ (3)

- 9** Expand and simplify: $(x + 2)(x^2 + x + 3)$. Note: multiply a binomial by a trinomial.

$(x + 2)(x^2 + x + 3)$ (4)

- 10** Expand and simplify: $(2x - 3)(x^2 + 2x - 1)$.

$(2x - 3)(x^2 + 2x - 1)$ (3)

- 11** Expand and simplify then collect like terms: $(x + 1)(x - 2) + (x - 3)(x + 4)$.

$(x + 1)(x - 2) + (x - 3)(x + 4)$ (3)

- 12** Expand and simplify: $(x + 5)(x - 5)$.

$(x + 5)(x - 5)$ (2)

- 13** Without expanding fully, state the coefficient of x^2 in the expansion of $(3x + 2)(5x - 1)$.

Find the coefficient of x^2 in $(3x + 2)(5x - 1)$. (2)

- 14** Expand and simplify fully: $(x + 2)(x - 3) - (x - 1)(x + 5)$.

(single) $(x + 2)(x - 3) - (x - 1)(x + 5)$

(3)

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- 15** A rectangle has length $(x + 3)$ metres and width $(2x - 1)$ metres. Expand and simplify an expression for its area.

(single) Area = $(x + 3)(2x - 1)$. Expand and simplify.

(4)

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- 16** Find the expanded form of $(ax + 2)(2x - b)$ and give the coefficient of x in terms of a and b .

(single) $(ax + 2)(2x - b)$

(4)

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- 17** A student expands $(x + 4)(x + k)$ and obtains $x^2 + (k + 4)x + 4k$. The student claims the coefficient of x is 10. Find k if the claim is correct.

(single) Find k given $k + 4 = 10$.

(3)

18 Stretch question. Expand and simplify fully, then factorise the result where possible: $(2x + 3)(x - 4) + (x + 1)(x - 2)$.

(3) $(2x + 3)(x - 4) + (x + 1)(x - 2)$. Expand, simplify and factorise where possible.

Mark scheme · KS3.M-A13 Expanding Double Brackets

Question 1

- (a) **B1** $x^2 + 8x + 15$ cao
- (a) Answer: **$x^2 + 8x + 15$**
- (b) **B1** $2x^2 + 7x - 4$ cao
- (b) Answer: **$2x^2 + 7x - 4$**
- (c) **B1** $x^2 - 8x + 12$ cao
- (c) Answer: **$x^2 - 8x + 12$**
- (d) **B1** $3x^2 - 13x - 10$ cao
- (d) Answer: **$3x^2 - 13x - 10$**

Question 2

- (single) **M1** two products found correctly, e.g. $x \cdot x$ and $x \cdot (-2)$ or $7 \cdot x$ and $7 \cdot (-2)$ or equivalent
- (single) **M1** all four terms written before combining or a correct partial combination
- (single) **A1** $x^2 + 5x - 14$ cao
- (single) Answer: **$x^2 + 5x - 14$**

Question 3

- (single) **M1** correct multiplication of first terms and outer/inner terms shown
- (single) **M1** all four terms or combined equivalent
- (single) **A1** $4x^2 + 4x - 3$ cao
- (single) Answer: **$4x^2 + 4x - 3$**

Question 4

- (single) **M1** method shown: $(x + 6)(x + 6)$ or formula $a^2 + 2ab + b^2$ used
- (single) **M1** first term squared and outer/inner terms identified
- (single) **M1** middle term combined correctly
- (single) **A1** $x^2 + 12x + 36$ cao
- (single) Answer: **$x^2 + 12x + 36$**

Question 5

- (single) **M1** method: $(3x - 2)(3x - 2)$ or use $a^2 - 2ab + b^2$
- (single) **M1** middle term found correctly
- (single) **A1** $9x^2 - 12x + 4$ cao
- (single) Answer: **$9x^2 - 12x + 4$**

Question 6

- (single) **M1** first and outer/inner/last products attempted correctly
- (single) **M1** all four terms written
- (single) **M1** like terms combined correctly
- (single) **A1** $2x^2 + 13x + 20$ cao
- (single) Answer: **$2x^2 + 13x + 20$**

Question 7

- (single) **M1** multiplication terms found correctly
- (single) **M1** terms combined where appropriate
- (single) **A1** $3x^2 - 7x - 6$ cao
- (single) Answer: **$3x^2 - 7x - 6$**

Question 8

- (single) **M1** multiplications shown correctly
- (single) **M1** like terms combined
- (single) **A1** $4x^2 - 7x - 2$ cao
- (single) Answer: **$4x^2 - 7x - 2$**

Question 9

- (single) **M1** x multiplied by each term of the trinomial or equivalent
- (single) **M1** 2 multiplied by each term of the trinomial or equivalent
- (single) **M1** all terms collected
- (single) **A1** $x^3 + 3x^2 + 5x + 6$ cao
- (single) Answer: **$x^3 + 3x^2 + 5x + 6$**

Question 10

- (single) **M1** 2x multiplied across and -3 multiplied across shown
- (single) **M1** terms combined correctly
- (single) **A1** $2x^3 + x^2 - 8x + 3$ cao
- (single) Answer: **$2x^3 + x^2 - 8x + 3$**

Question 11

- (single) **M1** each pair of brackets expanded correctly (may be one M1)
- (single) **M1** all like terms collected
- (single) **A1** $2x^2 - 14$ cao
- (single) Answer: **$2x^2 - 14$**

Question 12

- (single) **M1** method: use difference of squares or multiply out
- (single) **A1** $x^2 - 25$ cao
- (single) Answer: **$x^2 - 25$**

Question 13

- (single) **M1** recognise coefficient comes from $3x * 5x$
- (single) **A1** 15 cao
- (single) Answer: **15**

Question 14

- (single) **M1** each pair expanded correctly
- (single) **M1** subtraction applied and like terms combined
- (single) **A1** $-5x - 1$ cao
- (single) Answer: **$-5x - 1$**

Question 15

- (single) **M1** apply multiplication to find each term
- (single) **M1** all terms written out
- (single) **M1** like terms combined
- (single) **A1** $2x^2 + 5x - 3$ cao
- (single) Answer: **$2x^2 + 5x - 3$**

Question 16

- (single) **M1** expand to get terms ax^2x , $ax^*(-b)$, 2^2x , $2^*(-b)$
- (single) **M1** write expanded polynomial with each term
- (single) **M1** collect like terms for x term
- (single) **A1** $2ax^2 + (4 - ab)x - 2b$ cao for the coefficient part, coefficient is $4 - ab$
- (single) Answer: **$2ax^2 + (4 - ab)x - 2b$**

Question 17

- (single) **M1** set up equation $k + 4 = 10$
- (single) **M1** solve equation correctly
- (single) **A1** 6 cao
- (single) Answer: **6**

Question 18

- (single) **M1** each product expanded correctly or method shown
- (single) **M1** like terms combined correctly
- (single) **A1** $3x^2 - 6x - 14$ cao (does not factorise over the integers)
- (single) Answer: **$3x^2 - 6x - 14$**