Year 10 expanding brackets worksheet

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Name: _____ Date: _____

Question 1

Expand:

(a) 3(x + 4)

(b) x(x - 5)

(c) -2a(a + 3)

Answer: _____

Question 2

Expand and simplify:

(a) (x + 3)(x + 5)

(b) (x - 4)(x + 2)

Answer: _____

Question 3

Expand and simplify:

(a) (x - 6)(x - 3)

(b) (2x + 1)(x - 4)

(c) (3a - 2)(2a + 5)

Answer: _____

Question 4

Expand using the special products:

(a) $(x + 7)^2$

(b) $(y - 5)^2$

(c) (2m - 3)(2m + 3)

Answer: _____

Question 5

Expand and simplify:

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

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

Answer: _____

Question 6

Ben says that $(x + 5)^2 = x^2 + 25$.

(a) Substitute $x = 1$ into both sides to show that Ben is wrong.

(b) Write the correct expansion of $(x + 5)^2$ and explain what Ben left out.

Answer: _____

Question 7

A square garden bed has sides of x metres. A path 2 m wide is built all the way around the outside of the bed.

(a) Write an expression for the side length of the outer square (bed and path together), and expand an expression for its area.

(b) Show that the area of the path is $(8x + 16)$ m², and factorise this expression.

(c) The path has an area of 96 m². Find the side length of the garden bed.

Answer: _____

Question 8

(a) Expand and simplify $(n + 1)^2 - n^2$. Use your answer to explain why the difference between the squares of two consecutive whole numbers is always odd.

(b) Show that $(n + 3)^2 - (n - 3)^2$ is always a multiple of 12.

Answer: _____

Question 9

Expand and simplify.

(a) $\frac{1}{2}(4x - 6)$

(b) $\frac{2}{3}(6x + 9)$

Answer: _____

Question 10

Expand and simplify.

(a) $\frac{2}{3}(3x - 6) - \frac{1}{4}(8x + 4)$

(b) $\frac{1}{2}(x + 4) + \frac{1}{3}(2x - 3)$

Answer: _____

Year 10 expanding brackets: answers and worked solutions

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Question 1

Answer: (a) $3x + 12$ (b) $x^2 - 5x$ (c) $-2a^2 - 6a$

Question 2

Answer: (a) $x^2 + 8x + 15$ (b) $x^2 - 2x - 8$

Question 3

Answer: (a) $x^2 - 9x + 18$ (b) $2x^2 - 7x - 4$ (c) $6a^2 + 11a - 10$

Question 4

Answer: (a) $x^2 + 14x + 49$ (b) $y^2 - 10y + 25$ (c) $4m^2 - 9$

Question 5

Answer: (a) $5x + 9$ ($x^2 + 7x + 10 - x^2 - 2x - 1$) (b) $2x^2 + 18$

Question 6

Answer: (a) Left: $6^2 = 36$. Right: $1 + 25 = 26$. These are not equal. (b) $x^2 + 10x + 25$. Ben left out the middle term $10x$ (he squared each term instead of multiplying $(x + 5)(x + 5)$ fully).

Question 7

Answer: (a) $(x + 4)$ m; area $= x^2 + 8x + 16$ (b) path $= (x^2 + 8x + 16) - x^2 = 8x + 16 = 8(x + 2)$ (c) 10 m ($8x + 16 = 96$)

Question 8

Answer: (a) $2n + 1$. This is one more than an even number ($2n$), so it is always odd. (b) $(n^2 + 6n + 9) - (n^2 - 6n + 9) = 12n$, which has a factor of 12.

Question 9

Answer: (a) $2x - 3$ (b) $4x + 6$

Question 10

Answer: (a) -5 ($2x - 4 - 2x - 1$) (b) $7x/6 + 1$ (also accept $(7x + 6)/(6)$)