Expanding triple brackets

ANSWERS

1

Expand and simplify $(x^2 + 2x + 1)(x + 3)$

×	x^2	$+2x$	$+1$
x	x^3	$2x^2$	x
$+3$	$3x^2$	$6x$	3

Answer $x^3 + 5x^2 + 7x + 3$

2

Expand and simplify $(x^2 + 4x + 2)(x + 1)$

×	x^2	$+4x$	$+2$
x	x^3	$4x^2$	$2x$
$+1$	x^2	$4x$	2

Answer $x^3 + 5x^2 + 6x + 2$

3

Expand and simplify $(x + 2)(x^2 + x + 3)$

×	x^2	$+x$	$+3$
x	x^3	x^2	$3x$
$+2$	$2x^2$	$2x$	6

Answer $x^3 + 3x^2 + 5x + 6$

4

Expand and simplify $(x + 2)(x + 3)(x + 4)$

×	x	$+2$
x	x^2	$2x$
$+3$	$3x$	6

$= x^2 + 5x + 6$

×	x^2	$+5x$	$+6$
x	x^3	$5x^2$	$6x$
$+4$	$4x^2$	$20x$	24

Answer $x^3 + 9x^2 + 26x + 24$

5

Expand and simplify $(x + 1)(x + 1)(x + 5)$

×	x	$+1$
x	x^2	x
$+1$	x	1

$= x^2 + 2x + 1$

×	x^2	$+2x$	$+1$
x	x^3	$2x^2$	x
$+5$	$5x^2$	$10x$	5

Answer $x^3 + 7x^2 + 11x + 5$

6

Expand and simplify $(x + 3)(x + 3)(x + 2)$

×	x	$+3$
x	x^2	$3x$
$+3$	$3x$	9

$= x^2 + 6x + 9$

×	x^2	$+6x$	$+9$
x	x^3	$6x^2$	$9x$
$+2$	$2x^2$	$12x$	18

Answer $x^3 + 8x^2 + 21x + 18$

7 *Notice the change!*

Expand and simplify $(x + 2)(x + 4)(x - 1)$

×	x	$+2$
x	x^2	$2x$
$+4$	$4x$	8

$= x^2 + 6x + 8$

×	x^2	$+6x$	$+8$
x	x^3	$6x^2$	$8x$
-1	$-x^2$	$-6x$	-8

Answer $x^3 + 5x^2 + 2x - 8$

8

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

×	x	-1
x	x^2	$-x$
-3	$-3x$	3

$= x^2 - 4x + 3$

×	x^2	$-4x$	$+3$
x	x^3	$-4x^2$	$3x$
$+2$	$2x^2$	$-8x$	6

Answer $x^3 - 2x^2 - 5x + 6$

Expanding triple brackets *further practice*

ANSWERS

9

Expand and simplify

$(x + 2)(x + 1)(x + 7)$

$= (x^2 + 3x + 2)(x + 7)$

Answer $x^3 + 10x^2 + 23x + 14$

10

Expand and simplify

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

$= (x^2 + 3x - 10)(x + 1)$

Answer $x^3 + 4x^2 - 7x - 10$

11

Expand and simplify $(x + 1)^2(x + 4)$

$= (x + 1)(x + 1)(x + 4)$

$= (x^2 + 2x + 1)(x + 4)$

Answer $x^3 + 6x^2 + 9x + 4$

12

A cuboid has edges of x cm, $(x + 2)$ cm and $(x + 5)$ cm. Find an expression for its volume. Expand and simplify.

$= x(x + 2)(x + 5)$

$= x(x^2 + 7x + 10)$

Answer $x^3 + 7x^2 + 10x$ cm^3

13

Expand and simplify

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

$= (x^2 - 5x + 6)(x + 1)$

Answer $x^3 - 4x^2 + x + 6$

14

Expand and simplify $(x + 3)^3$

$= (x + 3)(x + 3)(x + 3)$

$= (x^2 + 6x + 9)(x + 3)$

Answer $x^3 + 9x^2 + 27x + 27$

15

$(x + 1)(x + 4)(x + k) = x^3 + 8x^2 + bx + c$.
Find the values of k, b and c.

$= (x^2 + 5x + 4)(x + k)$

x^2: $5 + k = 8$

Answer $k = 3$, $b = 19$, $c = 12$

16

Ria says $(x + 1)(x + 2)(x + 3) = x^3 + 6$.
Explain why she is wrong.

she multiplied only the x terms and the numbers

every term times every term:

Answer $x^3 + 6x^2 + 11x + 6$