Factorising quadratics: harder

ANSWERS

1

Use the grid to factorise $2x^2 + 9x + 4$

×	x	+4
$2x$	$2x^2$	$8x$
+1	x	4

Answer $(2x + 1)(x + 4)$

2

Use the grid to factorise $3x^2 + 17x + 10$

×	x	+5
$3x$	$3x^2$	$15x$
+2	$2x$	10

Answer $(3x + 2)(x + 5)$

3

Use the grid to factorise $2x^2 + 9x + 7$

×	x	+1
$2x$	$2x^2$	$2x$
+7	$7x$	7

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

4

Factorise $2x^2 + 11x + 15$

$2 \times 15 = 30$

6 and 5

×	x	+3
$2x$	$2x^2$	$6x$
+5	$5x$	15

Answer $(2x + 5)(x + 3)$

5

Factorise $3x^2 + 13x + 4$

$3 \times 4 =$ 12

12 and 1

×	x	+4
$3x$	$3x^2$	$12x$
+1	x	4

Answer $(3x + 1)(x + 4)$

6

Factorise $2x^2 + 9x + 9$

$2 \times 9 = 18$

6 and 3

×	x	+3
$2x$	$2x^2$	$6x$
+3	$3x$	9

Answer $(2x + 3)(x + 3)$

7 Notice the change!

Factorise $2x^2 + x - 6$

$2 \times (-6) = -12$

4 and −3

×	x	+2
$2x$	$2x^2$	$4x$
−3	$-3x$	−6

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

8

Factorise $3x^2 - 11x + 6$

$3 \times 6 = 18$

−9 and −2

×	x	−3
$3x$	$3x^2$	$-9x$
−2	$-2x$	6

Answer $(3x - 2)(x - 3)$

Factorising quadratics: harder *further practice*

ANSWERS

9

Factorise $2x^2 + 15x + 7$

$2 \times 7 = 14$: 14 and 1

$2x^2 + 14x + x + 7$

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

10

Factorise $3x^2 + 11x + 10$

$3 \times 10 = 30$: 6 and 5

$3x^2 + 6x + 5x + 10$

Answer $(3x + 5)(x + 2)$

11

Factorise $5x^2 + 11x + 2$

$5 \times 2 = 10$: 10 and 1

$5x^2 + 10x + x + 2$

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

12

Factorise $2x^2 - 3x - 9$

$2 \times (-9) = -18$: −6 and 3

$2x^2 - 6x + 3x - 9$

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

13

Factorise $3x^2 - 8x + 4$

$3 \times 4 = 12$: −6 and −2

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

Answer $(3x - 2)(x - 2)$

14

A rectangle has an area of $3x^2 + 17x + 10$ cm². Its width is $(x + 5)$ cm. Find expressions for its length and its perimeter.

area $= (3x + 2)(x + 5)$

perimeter $= 2(3x + 2) + 2(x + 5)$

Answer $3x + 2$ cm; $8x + 14$ cm

15

Factorise $4x^2 + 8x + 3$

$4 \times 3 = 12$: 6 and 2

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

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

16

Ana factorises $2x^2 + 8x + 6$ as $(2x + 2)(x + 3)$. Is her answer fully factorised? Explain.

No: it multiplies out right, but

$2x + 2$ has a common factor of 2

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