

GCSE Maths: Factorising quadratic expressions (Higher): worksheet

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.1

Name: _____

Date: _____

Score: _____

14 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch14-quadratics-simultaneous/higher/factorising-quadratic-expressions/

Exercise 14A Factorising quadratic expressions Non-calculator

1 Factorise by taking out the highest common factor.

(a) $6x + 9$

Answer: _____

(b) $10x - 15$

Answer: _____

(c) $x^2 + 5x$

Answer: _____

(d) $4x^2 - 12x$

Answer: _____

(e) $9x^2 + 6x$

Answer: _____

(f) $8x^2 - 8x$

Answer: _____

2 Factorise.

(a) $x^2 + 5x + 6$

Answer: _____

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

Answer: _____

(c) $x^2 + 8x + 15$

Answer: _____

(d) $x^2 + 9x + 20$

Answer: _____

(e) $x^2 + 6x + 8$

Answer: _____

(f) $x^2 + 10x + 24$

Answer: _____

3 Factorise.

(a) $x^2 - 6x + 8$

Answer:

(b) $x^2 - 7x + 10$

Answer:

(c) $x^2 - 8x + 15$

Answer:

(d) $x^2 - 9x + 14$

Answer:

(e) $x^2 - 10x + 21$

Answer:

(f) $x^2 - 5x + 4$

Answer:

4 Factorise.

(a) $x^2 + 2x - 8$

Answer:

(b) $x^2 + x - 12$

Answer:

(c) $x^2 - 3x - 10$

Answer:

(d) $x^2 - 2x - 15$

Answer:

(e) $x^2 + 4x - 21$

Answer:

(f) $x^2 - x - 20$

Answer:

5 Factorise these differences of two squares.

(a) $x^2 - 9$

Answer:

(b) $x^2 - 16$

Answer:

(c) $x^2 - 100$

Answer:

(d) $x^2 - 1$

Answer:

(e) $4x^2 - 25$

Answer:

(f) $9x^2 - 4$

Answer:

- 6 Zara says that $x^2 + 8x + 12 = (x + 3)(x + 4)$. Explain why she is wrong and write the correct factorisation.

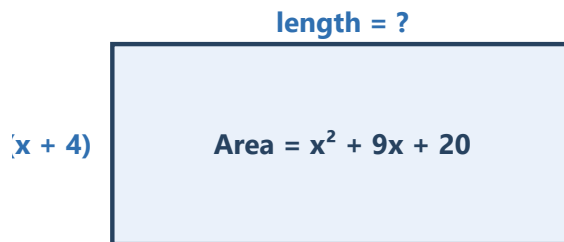
Answer:

- 7 Three of these four expressions can be factorised into two brackets. Which one cannot?

$x^2 + 6x + 9$, $x^2 - 25$, $x^2 + 4x + 5$, $x^2 - 5x + 6$

Answer:

- 8 The area of this rectangle is $(x^2 + 9x + 20) \text{ cm}^2$. The width is $(x + 4) \text{ cm}$. Find an expression for the length.



Answer:

- 9 Factorise.

(a) $x^2 + 12x + 35$

Answer:

(b) $x^2 - 4x$

Answer:

(c) $7x - 21$

Answer:

(d) $x^2 - 144$

Answer:

(e) $x^2 - 11x + 28$

Answer:

(f) $x^2 + 3x - 28$

Answer:

- 10 Use the difference of two squares to work out, **without a calculator**.

(a) $52^2 - 48^2$

Answer:

(b) $101^2 - 99^2$

Answer:

11 Factorise.

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

Answer:

(b) $3x^2 + 10x + 8$

Answer:

(c) $2x^2 - 5x - 3$

Answer:

(d) $5x^2 - 11x + 2$

Answer:

(e) $6x^2 + x - 2$

Answer:

(f) $4x^2 - 4x - 3$

Answer:

12 Factorise fully (take out the common factor first).

(a) $2x^2 - 50$

Answer:

(b) $3x^2 + 15x + 18$

Answer:

(c) $5x^2 - 45$

Answer:

(d) $2x^2 - 12x + 16$

Answer:

(e) $6x^2 + 9x$

Answer:

(f) $4x^2 - 36$

Answer:

13 Show that $(2n + 1)^2 - (2n - 1)^2$ is a multiple of 8 for every positive whole number n .

Answer:

14 The expression $x^2 + bx + 12$ can be factorised into two brackets with whole numbers in them for certain values of b . How many different values of b (positive or negative) are possible? List them.

Answer: