



# What's gone wrong? Solutions



- Here is a student's work on expanding brackets.
- Take a look and decide if they have done the work correctly or not.
- If they have made a mistake can you say why ?
- What are the correct answers?

$$\begin{array}{l} (x+3)(x-1) \\ x^2 + 2x - 3 \end{array}$$

Correct

$$\begin{array}{l} (x+2)(x+3) \\ x^2 + 6x + 5 \end{array}$$

$$+2x + 3x \quad +2 \times 3$$

$$= x^2 + 5x + 6$$

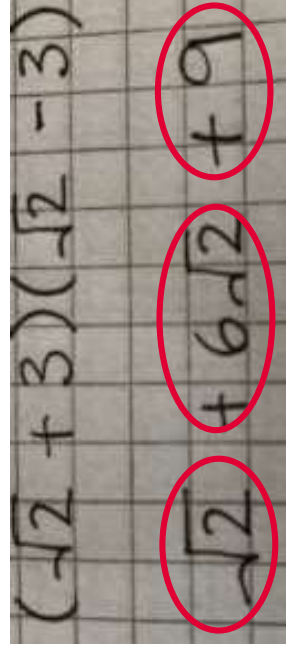
$$\begin{array}{l} (x+4)(x-5) \\ x^2 + 9x - 20 \end{array}$$

$$+4x - 5x$$

$$= x^2 - x - 20$$



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$$(-\sqrt{2} + 3)(-\sqrt{2} - 3)$$

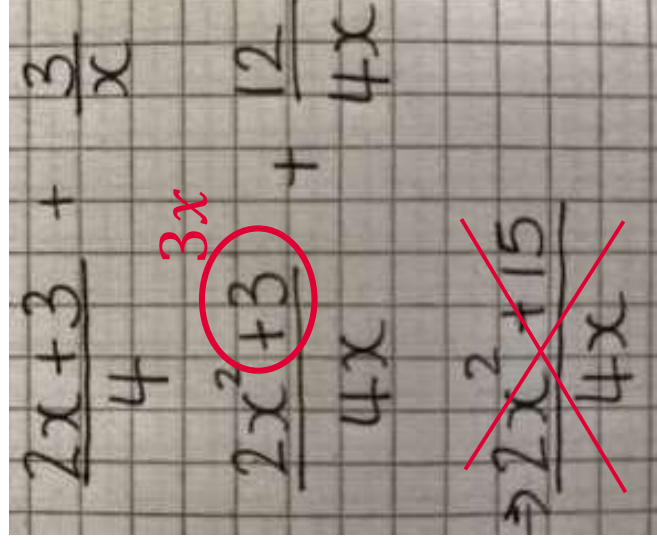
$$\sqrt{2} + 6\sqrt{2} + 9$$

$$\sqrt{2} \times \sqrt{2} + 3\sqrt{2} - 3\sqrt{2} + 3 \times -3$$

$$2 \qquad 0 \qquad -9$$

$$= 2 + 0 + (-9)$$

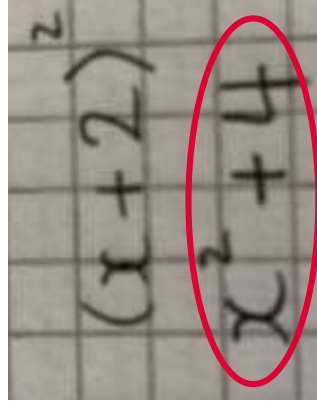
$$= -7$$



$$\frac{2x+3}{4} + \frac{3}{x}$$

$$\frac{2x^2+3}{4x} + \frac{12}{4x}$$

$$\Rightarrow \frac{2x^2+15}{4x}$$



$$(x+2)^2$$

$$x^2 + 4$$

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

$$= x^2 + 2x + 2x + 4$$

$$= x^2 + 4x + 4$$

$$= \frac{2x^2 + 3x + 12}{4x}$$



- Expand the expressions on the left of the page and find the matching expression in the grid on the right of the page.
- When completed there should be four answers unmatched.
- Find the sum of these four expressions and simplify it

- $(x + 3)^2$
- $(x + 4)(x + 3)$
- $(x - 4)^2 - 2$
- $(x - 3)(x + 4)$
- $(x + 5)^2 + 3$
- $x(x + 4) + 2(x + 4)$
- $(3 - x)(3 + x)$
- $x(x - 8) - (x - 8)$

$x^2 + 6x - 16$	$x^2 + 6x + 9$	$x^2 + 6x + 8$	$x^2 + 9$
$x^2 + 7x + 12$	$x^2 - 9x + 8$	$x^2 - 5x + 12$	$x^2 - 8x + 14$
$9 - x^2$	$-x^2 + 6x + 36$	$x^2 + 10x + 28$	$x^2 + x - 12$



# Expand and Simplify



Solutions on the next slide....



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- $(x + 3)^2$
- $(x + 4)(x + 3)$
- $(x - 4)^2 - 2$
- $(x - 3)(x + 4)$
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- $x(x + 4) + 2(x + 4)$
- $(3 - x)(3 + x)$
- $x(x - 8) - (x - 8)$

$x^2 + 6x - 16$	$x^2 + 6x + 9$	$x^2 + 6x + 8$	$x^2 + 9$
$x^2 + 7x + 12$	$x^2 - 9x + 8$	$x^2 - 5x + 12$	$x^2 - 8x + 14$
$9 - x^2$	$-x^2 + 6x + 36$	$x^2 + 10x + 28$	$x^2 + x - 12$

The four expressions left simplify to  $2x^2 + 7x + 41$

## Write some digits in a circle

e.g.  $\begin{matrix} & 5 & \\ 3 & & 4 \end{matrix}$

$\begin{matrix} & & 8 & 6 \end{matrix}$

- The sum of the squares of the two-digit numbers read clockwise is
$$54^2 + 46^2 + 68^2 + 83^2 + 35^2 = 17770$$
- The sum of the squares of the two-digit numbers read anticlockwise is
$$53^2 + 38^2 + 86^2 + 64^2 + 45^2 = 17770$$

**Prove that the two sums will always be equal for any circle of digits**

[Hint](#)

[Solution](#)