



# Timester Challenge

## Identities



Identify if it is an equation (=) or an identity ( $\equiv$ ) by using the correct symbols.

$$2x + 4 \square 15$$

$$3(x - 4) \square 3x - 12$$

$$x^2 - a^2 \square (x + a)(x - a)$$

$$2(x + 3) \square 24$$

$$x^2 \square 16$$

$$5x + 8 \square 2(x + 4) + 3x$$

Bronze ★

Find a solution for a and b by equating the coefficients.

$$(2x - 4)(x + 3) + 5 \equiv 2x^2 + ax + b$$

Silver ★

Find a solution for a, b and c by equating the coefficients.

$$2x^2 + 8x - 4 \equiv a(x + b)^2 + c$$

Silver ★

Find a solution for a and b by equating the coefficients.

$$\frac{ax^2 + 11x + b}{x + 4} \equiv 2x + 3$$

Silver ★

Find a solution for a and b by equating the coefficients.

$$7(ax + 3) - 2(5x + b) \equiv 4x + 13$$

Gold ★

Find a solution for a and b by equating the coefficients.

$$2(4x + 8) - 3(ax - 5) \equiv 2x + b$$

Gold ★

# Timester Challenge Identities

## Answers



|   |   |   |
|---|---|---|
| <p>Identify if it is an equation (=) or an identity (<math>\equiv</math>) by using the correct symbols.</p> $2x + 4 = 15$ | <p>Find a solution for a and b by equating the coefficients.</p> $(2x - 4)(x + 3) + 5 \equiv 2x^2 + ax + b$ $2x^2 + 6x - 4x - 12 + 5 \equiv 2x^2 + 2x - 7$ <p>So <math>a = 2</math> and <math>b = -7</math></p> <p style="text-align: right;">Silver ★</p>  | <p>Find a solution for a and b by equating the coefficients.</p> $7(ax + 3) - 2(5x + b) \equiv 4x + 13$ $7ax + 21 - 10x - 2b \equiv 4x + 13$ <p>So <math>7ax - 10x \equiv 4x</math><br/> <math>(14x - 10x = 4x)</math><br/>                     hence <math>a = 2</math><br/>                     So <math>21 - 2b = 13</math><br/>                     hence <math>b = 4</math></p> <p style="text-align: right;">Gold ★</p> |
| $3(x - 4) \equiv 3x - 12$ $x^2 - a^2 \equiv (x + a)(x - a)$ $2(x + 3) = 24$   | <p>Find a solution for a, b and c by equating the coefficients.</p> $2x^2 + 8x - 4 \equiv a(x + b)^2 + c$ $2(x^2 + 4x) - 4$ $\equiv 2(x + 2)^2 - 8 - 4$ $\equiv 2(x + 2)^2 - 12$ <p>So <math>b = 2</math> and <math>c = -12</math></p> <p style="text-align: right;">Silver ★</p>                         | <p>Find a solution for a and b by equating the coefficients.</p> $2(4x + 8) - 3(ax - 5) \equiv 2x + b$ $8x + 16 - 3ax + 10 \equiv 2x + b$ <p>So <math>8x - 3ax \equiv 2x</math><br/> <math>(8x - 6x = 2x)</math><br/>                     hence <math>a = 3</math><br/>                     So <math>16 + 10 = 26</math><br/>                     hence <math>b = 26</math></p> <p style="text-align: right;">Gold ★</p>      |
| $x^2 = 16$ $5x + 8 \equiv 2(x + 4) + 3x$ <p style="text-align: right;">Bronze ★</p>                                       | <p>Find a solution for a and b by equating the coefficients.</p> $\frac{ax^2 + 11x + b}{x + 4} \equiv 2x + 3$ $\frac{(2x + 3)(x + 4)}{x + 4} \equiv 2x + 3$ $\frac{2x^2 + 11x + 12}{x + 4} \equiv 2x + 3$ <p>So <math>a = 2</math> and <math>b = 12</math></p> <p style="text-align: right;">Silver ★</p> | <p>Find a solution for a and b by equating the coefficients.</p> $2(4x + 8) - 3(ax - 5) \equiv 2x + b$ $8x + 16 - 3ax + 10 \equiv 2x + b$ <p>So <math>8x - 3ax \equiv 2x</math><br/> <math>(8x - 6x = 2x)</math><br/>                     hence <math>a = 3</math><br/>                     So <math>16 + 10 = 26</math><br/>                     hence <math>b = 26</math></p> <p style="text-align: right;">Gold ★</p>      |