Equation or identity?

ANSWERS

1

Work out both sides for $x = 1$, 2 and 3.
Equation or identity?

$3(x + 4) \equiv 3x + 12$

x	left side	right side	equal?
1	15	15	✓
2	18	18	✓
3	21	21	✓

equation **identity**

2

Work out both sides for $x = 1$, 2 and 3.
Equation or identity?

$5x - 4 = 3x + 2$

x	left side	right side	equal?
1	1	5	✗
2	6	8	✗
3	11	11	✓

equation identity

3

Work out both sides for $x = 1$, 2 and 3.
Equation or identity?

$x + x + 2 \equiv 2(x + 1)$

x	left side	right side	equal?
1	4	4	✓
2	6	6	✓
3	8	8	✓

equation **identity**

4

Work out both sides for $x = 1$, 2 and 3.
Equation or identity?

$2x + 7 = 4x + 3$

x	left side	right side	equal?
1	9	7	✗
2	11	11	✓
3	13	15	✗

equation identity

5

Show that the two sides are identical.

$2(x + 5) - 3 \equiv 2x + 7$

Left side = 2x + 10 − 3

= 2x + 7

which is the right side ✓

6

Tom puts $x = 3$ into both sides of
$2x + 4 = 4x - 2$ and gets 10 both times.
He says it is an identity.
Is Tom right? Explain.

When x = 1: 6 and 2

not equal, so an equation

one value is not enough

Answer **No**

7

Show that the two sides are identical.

$3(2x + 1) + 2(x + 4) \equiv 8x + 11$

Left side = 6x + 3 + 2x + 8

= 8x + 11

which is the right side ✓

8

Show that the two sides are identical.

$(x + 2)^2 - 4 \equiv x(x + 4)$

Left side = (x + 2)(x + 2) − 4

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

$= x^2 + 4x$

Right side = x(x + 4) = $x^2 + 4x$

Equation or identity? *further practice*

ANSWERS

9

Show that the two sides are identical.

$5(x - 1) + 2x \equiv 7x - 5$

Left side = $5x - 5 + 2x$

$= 7x - 5$

which is the right side ✓

10

Circle each identity.

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

$4x - 1 = 11$

$2x \times 3 = 6x$

$7 - x = x + 1$

11

Find the value of a.

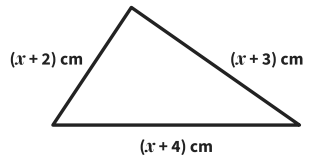
$2(3x + a) \equiv 6x + 10$

$6x + 2a \equiv 6x + 10$, so $2a = 10$

Answer *$a = 5$*

12

Show that the perimeter of this triangle is $3(x + 3)$ cm, whatever the value of x.



Perimeter = $x + 2 + x + 3 + x + 4$

$= 3x + 9 = 3(x + 3)$ ✓

13

Is $4(x - 1) + 6 = 4x + 2$ an equation or an identity? If it is an equation, solve it.

Left side = $4x - 4 + 6 = 4x + 2$

the same as the right side

It is *an identity*

14

Show that the two sides are identical.

$(x + 3)^2 - (x + 1)^2 \equiv 4(x + 2)$

$x^2 + 6x + 9 - (x^2 + 2x + 1)$

$= 4x + 8 = 4(x + 2)$ ✓

15

Find the values of a and b.

$5(x + a) + 2 \equiv bx + 17$

$5x + 5a + 2 \equiv bx + 17$

$b = 5$ and $5a + 2 = 17$

$a =$ *3*

$b =$ *5*

16

Jay works out both sides of $3x + 1 = x + 10$ for $x = 1$, 2 and 3. The sides are never equal. He says it is not an equation. Is he right? Explain.

$2x = 9$, so $x = 4.5$

it is true for one value

Answer *No, it is an equation*