

19. Introduction to Equations

What is an Equation?

Equation: A mathematical sentence that contains an unknown, such as $x + 5 = 12$

Solve an equation: Find the value of the unknown that makes the equation true

Method 1: Substitution Method (Trial Method) — Try substituting different numbers to find which one makes the equation true

a)

Example: Solving equations using substitution

$$x + 5 = 12 \rightarrow \text{Try } x=6: 6+5=11 \times \text{ Try } x=7: 7+5=12 \checkmark \rightarrow x = 7$$

$$2y = 14 \rightarrow \text{Try } y=6: 2 \times 6 = 12 \times \text{ Try } y=7: 2 \times 7 = 14 \checkmark \rightarrow y = 7$$

b)

Use substitution to verify which is the solution of the equation

$$x + 4 = 9 \quad x = 5 \quad \square \quad x = 4 \quad \square$$

$$y - 3 = 8 \quad y = 10 \quad \square \quad y = 11 \quad \square$$

c)

Solve the equation using substitution

$$x + 6 = 15 \rightarrow x = \square$$

$$y - 4 = 9 \rightarrow y = \square$$

$$3n = 18 \rightarrow n = \square$$

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d)

Solve the equation

$$x + 8 = 20 \rightarrow x = \boxed{}$$

$$y - 7 = 5 \rightarrow y = \boxed{}$$

$$4z = 24 \rightarrow z = \boxed{}$$

e)

Solve the equation

$$x + 12 = 30 \rightarrow x = \boxed{}$$

$$y - 9 = 11 \rightarrow y = \boxed{}$$

$$6n = 42 \rightarrow n = \boxed{}$$

f)

Write and solve equations based on the problem

A number plus 15 equals 28, what is this number?

Equation: Answer:

5 times a number equals 35, what is this number?

Equation: Answer: