

Chapter #8 Solving Linear Equations

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8.1 Solving Equations

equation: is a statement that 2 mathematical expressions have the same value

ex. $3x = -2$, $\frac{y}{2} = 1$, $z = -2.7$

Name the parts of an expression:

$$\begin{array}{c} \text{term} \quad \text{term} \quad \text{term} \\ \hline 1.2d + 3.5 = -1.6 \\ \swarrow \quad \downarrow \quad \swarrow \quad \nwarrow \\ \text{coefficient} \quad \text{variable} \quad \text{constants} \end{array}$$

variable: a letter or symbol that represents an unknown or changing value

coefficient: a # that multiplies a variable ex. $2x$
 \downarrow
 coefficient
 \nearrow variable

term: a #, a variable, or the product of #'s & variables

constant: a term in an expression or equation that is just a # ex. In $2x-4$, -4 is the constant

expression: a mathematical phrase that does NOT have an 'equal' sign. ex. $3x^2 - 2x + 7$

equation: a mathematical phrase that does have an equal sign ex. $2x - 7 = 1$

substitution: a specific value is assigned to a variable in an expression or equation
ex. $3x + 5$ when $x = 1$

Identify the following:

(a) $2 - 7p$

Annotations: 2 is labeled "constant" (red arrow), p is labeled "variable" (green arrow), and -7 is labeled "coefficient" (blue arrow).

(b) $3x^2 - 1y - 5$

Annotations: 3 and -1 are circled and labeled "coefficients" (red arrow). x^2 and y are labeled "variables" (green arrow). -5 is labeled "constant" (blue arrow). The text "coefficients: 3, -1" is written to the right.

When solving an equation, you need to find what # the variable is.

~~*~~ the RULE is: What you do to 1 side of the equal sign, you must do to the other side.

Ex. #2

(a) $\frac{-1/2x}{-1/2} = \frac{-3.96}{-1.2}$

The result $1x = 3.3$ is boxed in red.

(b) $\frac{r}{0.28} = -4.5 \times 0.28$

The result $r = -4.5 \times 0.28$ is underlined in red.

$$r = -4.5 \times 0.28$$

$$r = -1.26$$

Ex. #3

$$(a.) \quad x + 2.4 = 6.5$$
$$\quad \quad \quad \underline{-2.4} \quad \underline{-2.4}$$

$$x = 4.1$$

$$(b.) \quad 15.2 = -7.3 + x$$
$$\quad \quad \quad \underline{+7.3} \quad \underline{+7.3}$$

$$22.5 = x$$

$$(c.) \quad \frac{2x}{2} = \frac{3}{4} \div \frac{2}{1}$$

$$x = \frac{3}{4} \times \frac{1}{2}$$

$$x = \frac{3}{8}$$

$$(d.) \quad \frac{m}{3} = -\frac{2}{5} \times 3$$

$$m = -\frac{6}{5}$$

$$m = -1\frac{1}{5}$$

Check your answers using substitution!

Ex. #4

$$(a.) \quad x + 3 = 7$$
$$\quad \quad \quad \underline{-3} \quad \underline{-3}$$

$$x = 4$$

$$(4) + 3 = 7$$
$$7 = 7 \quad \checkmark$$

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