



Bell Ringer:



1. What is the difference between evaluating for x equals some number and solving for x ?

EXPRESSION

EQUATION

2. Evaluate the following expressions when $x=3$

$$2x + 5 - (7x - 7)(2/7) \quad 6 + 5 - 2/4 \cdot \frac{2}{x} \Rightarrow 11 - 4 \Rightarrow$$

$$(1/4)(3x - 4) + (3 + 2x)/(2x - 5)$$

$$\frac{1}{4} \cdot 5 + \frac{9}{1} \Rightarrow \frac{5}{4} + 9 \Rightarrow 10\frac{1}{4}$$

Equation Definition:

An equation is simply a statement about the equality of two expressions. In other words, anything that takes this form:

$$\text{Expression\#1} = \text{Expression\#2}$$

Exercise #1: Which of the following is **not** an equation?

(1) $3+1=4+0$

(3) $2(4x+1)$

(2) $x^2 - 2x = 8$

(4) $1+3=6$

Exercise #2: Consider the equation $2x - 8 = 10 - x$.

- (a) Why can't you determine whether this equation is true or false?

We don't have a
value for x

- (b) If $x = 5$, will the equation be true? How can you tell?

No.

$$2(5) - 8 = 10 - 5$$
$$10 - 8 = 10 - 5$$
$$2 \neq 5$$

- (c) Show that $x = 6$ makes the equation true. Remember to think very carefully always about your order of operations.

$$2(6) - 8 = 10 - 6$$
$$12 - 8 = 10 - 6$$
$$4 = 4 \checkmark$$

Exercise #3: Determine whether each of the following values for the given variable is a solution to the given equation. Show the calculations that lead to your final conclusions.

(a) $2x+3=17$ and $x=7$

$$\begin{array}{r} 2(7)+3=17 \\ 14+3 \\ 17 \end{array} \quad \checkmark$$

(b) $\frac{x-20}{5}=-4$ and $x=10$

$$\begin{array}{r} \frac{10-20}{5} = -4 \\ \frac{-10}{5} = -4 \\ \downarrow \\ -2 = -4 \end{array}$$

(c) $2(x+5)=6(x-1)$ and $x=4$

$$\begin{array}{r} 2(4+5)=6(4-1) \\ 2 \cdot 9 = 6 \cdot 3 \\ 18 = 18 \\ \checkmark \end{array}$$

Exercise #3: Determine whether each of the following values for the given variable is a solution to the given equation. Show the calculations that lead to your final conclusions.

(d) $x^2 - 1 = 2x + 2$ and $x = -1$

$$\begin{array}{r} (-1)^2 - 1 = 2(-1) + 2 \\ 1 - 1 \quad -2 + 2 \\ 0 = 0 \checkmark \end{array}$$

(e) $\frac{3(x+2)}{4} - 1 = 5$ and $x = 2$

$$\frac{3(2+2)}{4} - 1 = 5$$

$$\frac{3(4)}{4} - 1 = 5$$

(f) $\frac{3}{4}x - 1 = -\frac{1}{2}x + 9$ and $x = 8$

$$\frac{3}{4}(8) - 1 = -\frac{1}{2}(8) + 9$$

$$6 - 1 = -4 + 9$$

$$5 = 5 \checkmark$$

$$\frac{12}{4} - 1 = 5$$

$$3 - 1 = 5$$

$$2 = 5$$

Exercise #4: Kirk was checking to see if $x = 7$ was a solution to the equation $4x - 3 = 2x + 11$. He concluded that it was not a solution based on the following work. Was he correct?

$$4x - 3 = 2x + 11$$

$$\underline{4 \cdot 7} - 3 = \underline{2 \cdot 7} + 11$$

$$4 \cdot 4 = 2 \cdot 18$$

$$16 = 36 \text{ No!}$$

$$4 \cdot 7 - 3 = 2 \cdot 7 + 11$$

$$28 - 3 = 14 + 11$$

$$25 = 25$$

No.

FLUENCY

1. Decide if each of the following are **equations** or **expressions**. You do not need to solve the equations or evaluate the expressions.

(a) $5x+13$

Ex

(b) $4x+3=12$

Eq.

(c) $\frac{6(x-1)}{4}+1=5$

Eq.

(d) $3(x+2)^2-(45)^3$

Ex

(e) $3^2-5|2x-15|$

Ex

(f) $3[(x+2)^2+2(x-4)] = 3\sqrt[3]{4(2x+1)}$

Eq.

2. Determine whether each of the following values for the given variable is a solution to the given equation. Show the calculations that lead to your final conclusions.

(a) $x - 4 = 12$ and $x = 8$

$$8 - 4 = 12$$
$$\cancel{4 = 12}$$

No

(b) $\frac{(3+x)}{4} = 3$ and $x = 9$

$$\frac{(3+9)}{4} = 3$$
$$\frac{12}{4} = 3$$
$$3 = 3 \checkmark$$

YES

Determine whether each of the following values for the given variable is a solution to the given equation. Show the calculations that lead to your final conclusions.

(c) $(x+2) - 3(x-4) = 6$ and $x = 4$

$$(4+2) - 3(4-4) = 6$$

$$6 - 3(0) = 6$$

$$6 - 0 = 6$$

$$6 = 6$$

YES

(d) $\frac{1}{3}(x+2) = -\frac{2}{5}(x-9)$ and $x = 4$

$$\frac{1}{3}(4+2) = -\frac{2}{5}(4-9)$$

$$\frac{1}{3}(6) = -\frac{2}{5}(-5)$$

$$2 = 2 \checkmark$$

YES

3. A disease has three treatments, depending on the percent of the body affected by the disease. Doctors have the treatment down to three stages as follows;

Stage 1: less than 15%

Stage 2: 15-25%

Stage 3: 25-50%

For anything more than 50% there is no cure. If the disease is spreading according to the formula $P = 6d + 5$ where P is the percent of the body affected and d is the number of days, fill out the following chart and explain to a patient what you observed.

Days	% of body Affected
1	St. 1 11
2	St. 2 17
3	St. 2 23
4	St. 3 29
5	St. 3 35
6	St. 3 41
7	St. 3 47
8	53

$6(1) + 5$

Explanation of What You Observe:

Incurable on day
8. Seek early
detection, aggressive
treatment.

REASONING

4. Bobby wants to go on a school trip that will cost him \$250. He comes up with an equation that represents how much he needs to save each week as follows:

$$25w + 30 = 250, \text{ where } w \text{ is the number of weeks spent saving.}$$

- (a) If he has 9 weeks to save will he have enough money to go on the trip? Explain.

$$25(9) + 30 = 250$$

$$225 + 30 = 250$$

$$255 \neq 250$$

$255 > 250$, so YES, He'll HAVE ENOUGH IN 9 WKS.

- (b) He also wants to have \$100 spending cash on the trip. He decides to save an extra \$10 a week. To do this he changes his original equation as follows;

$$25w + 30 + 10w = 250 + 100, \text{ where } w \text{ is the number of weeks spent saving.}$$

Will nine weeks be enough time now? Show your calculations and Explain.

$$25(9) + 30 + 10(9) = 250 + 100$$

$$225 + 30 + 90 = 350$$

$$225 + 120 = 350$$

$$345 \neq 350$$

$345 < 350$, No It will not.

Group Work:

Do as much as you can here, then
complete the rest for homework