↳ equals ↳ more like a phrase

EXAMPLE 6 Distinguishing between Equations and Expressions

Decide whether each of the following is an *equation* or an *expression*.

a) $2x - 5y$ expression

b) $2x = 5y$ equation

c) $2x + 5 = 6$ equation

d) $2x + 5 - 6$ expression

1.4 Real Numbers and the Number Line

EXAMPLE 1 Using Negative Numbers in Applications

Use an integer to express the number in boldface italics in each application.

(a) The lowest Fahrenheit temperature ever recorded was ***129°*** below zero at Vostok, Antarctica, on July 21, 1983. (*Source: World Almanac and Book of Facts.*) -129

(b) General Motors had a loss of about $***31*** billion in 2008. (*Source: The Wall Street Journal.*) -31 billion

Natural Numbers: 1, 2, 3, ...

Whole Numbers: 0, 1, 2, 3, ...

Integers: ..., -3, -2, -1, 0, 1, 2, 3, ...

No fractions or decimals

Rational Numbers: can be written as a ratio / decimals either end or repeat

Ex. $\frac{2}{3}$ $-\frac{1}{2} = -0.5$ $4 = \frac{4}{1}$ $\frac{1}{3} = 0.\overline{3}$ or 0.333...

OR

Irrational Numbers: NOT rational: decimals don't end or repeat Ex. $\pi = 3.14159...$

Real Numbers: all of the above are real #s.

EXAMPLE 2 Determining Whether a Number Belongs to a Set

List the numbers in the following set that belong to each set of numbers.

$$\left\{-5, -\frac{2}{3}, 0, 0.\overline{6}, \sqrt{2}, 3\frac{1}{4}, 5, 5.8\right\}$$

(a) Natural numbers: 5

(b) Whole numbers: 0, 5,

(c) Integers: -5, 0, 5

(d) Rational numbers: $-5, 0, 5, -\frac{2}{3}, 0.\overline{6}, 3\frac{1}{4}, 5.8$ (all except $\sqrt{2}$)

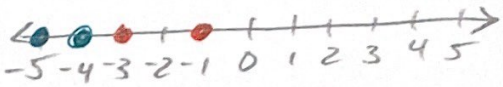
(e) Irrational numbers: $\sqrt{2} \approx 1.414213\ldots$

(f) Real numbers: all of them!

EXAMPLE 3 Determining the Order of Real Numbers

a) Is the statement $-3 < -1$ true or false?

-3 is Less than -1 True!

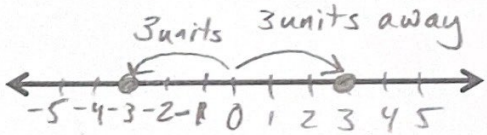


b) True or false? $-5 > -4$

-5 is greater than -4 False!

Absolute Value: always positive

Distance from zero



Ex $|4| = \boxed{4}$ and $|-4| = \boxed{4}$

EXAMPLE 4 Finding the Absolute Value

Simplify by finding the absolute value.

a) $|0| = 0$

b) $|-6| = 6$

c) $|7| = 7$

Do 1st!

d) $-|5|$

$-5 = \boxed{-5}$

e) $-|-5|$

$-5 = \boxed{-5}$

f) $|8-2|$

$= |6|$

$= \boxed{6}$

g) $-|8-2|$

$= -|6|$

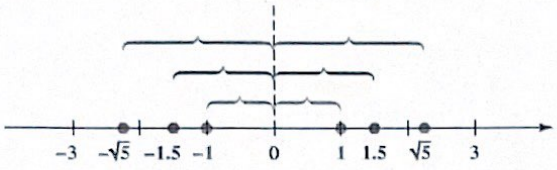
$= \boxed{-6}$

Additive Inverses (Opposite):

2 & -2 are opposites

$2 + -2 = 0$

additive inverses



Pairs of additive inverses, or opposites

FIGURE 11

What is the additive inverse of -9?

↳ 9

What is the additive inverse of 2.4?

↳ -2.4