

Lesson 14: Representing Contexts with Equations

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Let's write equations that represent situations.

14.1: Don't Solve It

Is the solution positive or negative?

$$(-8.7)(1.4) = a$$

$$-8.7b = 1.4$$

$$-8.7 + c = -1.4$$

$$-8.7 - d = -1.4$$

Negative
 ⌊ * neg • positive
 = neg

Negative
 ↓
 neg • neg
 = positive

positive
 ↓
 neg + positive
 = depends on larger number.

~~positive~~
 Negative
 ↓
 neg - (-)
 = negative

14.2: Warmer or Colder than Before?

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For each situation,

- Find two equations that could represent the situation from the bank of equations. (Some equations will not be used.)
- Explain what the variable v represents in the situation.
- Determine the value of the variable that makes the equation true, and explain your reasoning.

Bank of equations:

$-3v = 9$	$v = -16 + 6$	$v = \frac{1}{3} \cdot (-6)$	$v + 12 = 4$
$-4 \cdot 3 = v$	$v = 4 + (-12)$	$v = -16 - (6)$	$v = 9 + 3$
$-4 \cdot -3 = v$	$-3v = -6$	$-6 + v = -16$	$-4 = \frac{1}{3}v$
$v = -\frac{1}{3} \cdot 9$	$v = -\frac{1}{3} \cdot (-6)$	$v = 4 + 12$	$4 = 3v$

1. Between 6 a.m. and noon, the temperature rose 12 degrees Fahrenheit ⁺ to 4 degrees Fahrenheit ⁼.

$$v + 12 = 4$$

2. At midnight the temperature was -6 degrees. By 4 a.m. the temperature had fallen to -16 degrees ⁼.

$$-6 + v = -16$$

3. The temperature is 0 degrees at midnight and dropping 3 degrees per hour. The temperature is -6 degrees at a certain time.

$$-3v = -6$$

4. The temperature is 0 degrees at midnight and dropping 3 degrees per hour. The temperature is 9 degrees at a certain time.

$$-3v = 9$$

5. The temperature at 9 p.m. is one third the temperature at midnight.

14.3: Animals Changing Altitudes

1. Match each situation with a diagram.

a. A penguin is standing 3 feet above sea level and then dives down 10 feet. What is its depth? $+3 + (-10) = -7$ feet

b. A dolphin is swimming 3 feet below sea level and then jumps up 10 feet. What is its height at the top of the jump? $-3 + 10 = 7$ feet

c. A sea turtle is swimming 3 feet below sea level and then dives down 10 feet. What is its depth? $-3 + (-10) = -13$ feet

d. An eagle is flying 10 feet above sea level and then dives down to 3 feet above sea level. What was its change in altitude? $10 + x = 3$ change is -7 feet

e. A pelican is flying 10 feet above sea level and then dives down reaching 3 feet below sea level. What was its change in altitude? $10 + x = -3$ change is -13 feet

f. A shark is swimming 10 feet below sea level and then swims up reaching 3 feet below sea level. What was its change in depth? $-10 + x = -3$ change is $+7$ feet

