11.4 & 11.5

Multiplying and Dividing Integers

Essential Question

How are adding integers and subtracting integers related?

DO NOW

Evaluate the following.

1) $-19-15$

2) $-23-(-15)$

3) $28+(-19)$

4) $-54+17$

RULES FOR MULTIPLYING INTEGERS

Multiply numbers like regular multiplication… however…

POSITIVE X POSITIVE =
POSITIVE X NEGATIVE =
NEGATIVE X POSITIVE =
NEGATIVE x NEGATIVE =

1) 2×-3

2) -5×4

3) -3×-7

4) -8×3

5) $-6 \bullet -5$

6) $12(-4)$

7) -1×-15

8) $3 \bullet -2 \bullet -4$

9) $-5(-8)(-2)$

Exponents

Evaluate the following.

1) $(-3)^2$

2) $(-2)^4$

Important!!

$$(-4)^2 \quad vs \quad -4^2$$

Evaluation each expression

3) -2^4

4) $(-2)^4$

Practice

Evaluate the following.

5) $(-7)^2$

7) -9^2

6) -6^3

8) $(-5)^4$

Evaluating with negative numbers

Evaluate when a=-1, b=7, and c=5

9) $3a + 5b$

10) $\dfrac{2a + b}{c}$

Evaluating with negative numbers

Evaluate x^3 **if** $x = -2$

When "plugging in" a negative number into a problem PUT PARENTHESIS AROUND IT!!!!!!!!!!

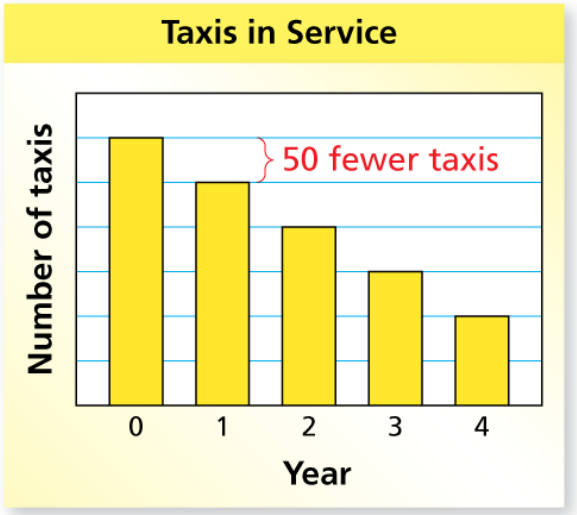
Evaluating with negative numbers

Evaluate when $x = -3$ and $y = -6$

11) $x^2 + y^2$

12) $-7x^2 + 33$

Real-Life Application



The bar graph shows the number of taxis a company has in service. The number of taxis decreases by the same amount each year for 4 years. Find the total change in the number of taxis.

RULES FOR DIVIDING INTEGERS

Divide numbers like regular division… however…

POSITIVE ÷ POSITIVE =
POSITIVE ÷ NEGATIVE =
NEGATIVE ÷ POSITIVE =
NEGATIVE ÷ NEGATIVE =

1) $8 \div -4$

2) $-20 \div 4$

3) $-21 \div -7$

4) $-36 \div 3$

5) $-30 \div -5$

6) $48 \div -4$

7) $-15 \div -1$

8) $\frac{-72}{9}$

9) $\frac{-56}{-8}$

Evaluating with negative numbers

Evaluate when $x = 8$ and $y = -4$

10) $10 - x^2 \div y$

Evaluating with negative numbers

Evaluate when $x = 8$ and $y = -4$

10) $10 - x^2 \div y$

Evaluating with negative numbers

Evaluate when a = -18 and b = -6

11) $\dfrac{a+6}{3}$

12) $\dfrac{b^2}{a}+4$

Real-Life Application

You measure the height of the tide using the support beams of a pier. Your measurements are shown in the picture. What is the mean hourly change in the height?

$$\text{mean hourly change} = \frac{\text{final height} - \text{initial height}}{\text{elapsed time}}$$