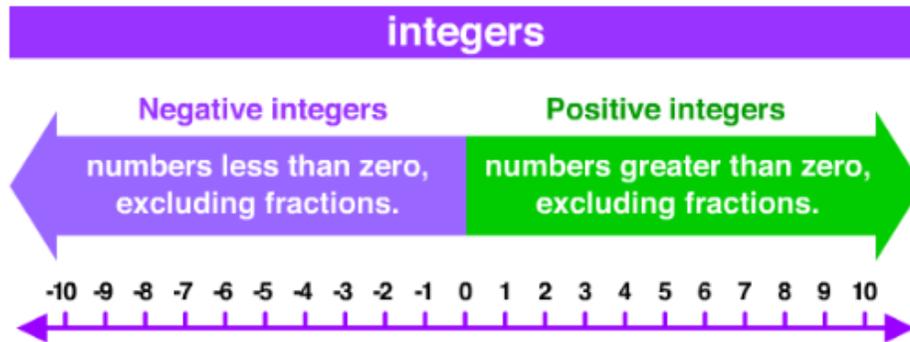
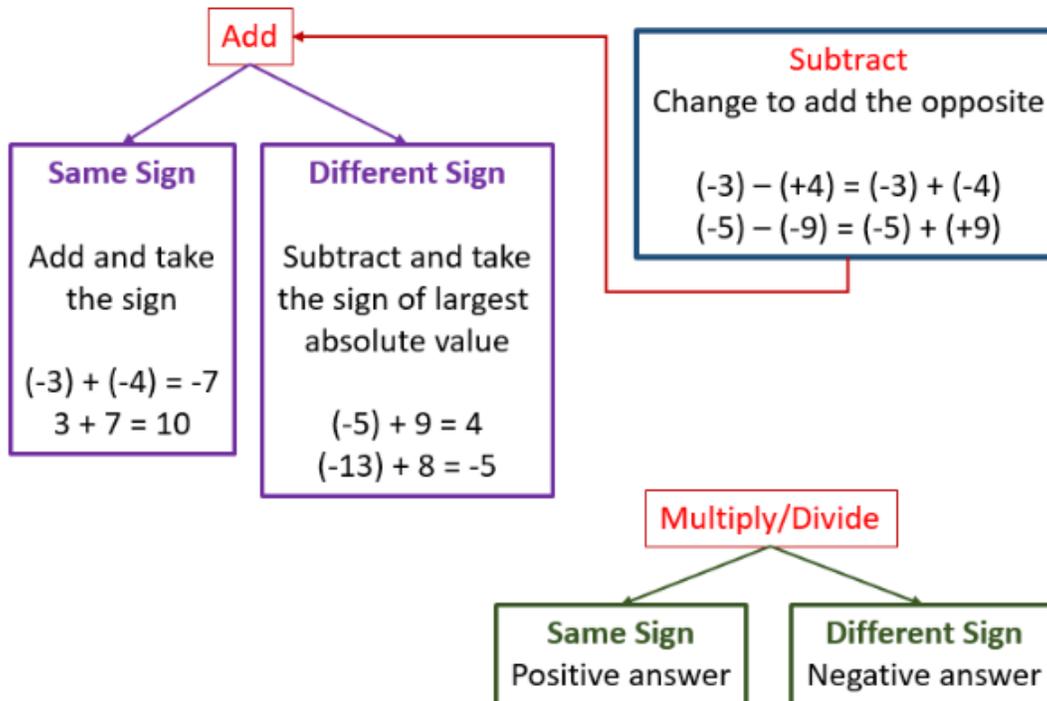


# Part 1: Integers and Coordinates



## Integer Rules



Complete the statement using  $<$ ,  $>$ , or  $=$ .

1.  $|-6| \underline{\quad} 6$

2.  $0 \underline{\quad} |3|$

3.  $|-5| \underline{\quad} |-9|$

4. One fish is 4 feet below sea level. Another fish is 3 feet below sea level. Write each position as an integer. Which integer is greater?

**Add.**

5.  $6 + (-3)$

6.  $8 + (-1) + (-3)$

7. You start hiking at an elevation that is 80 meters below base camp. You increase your elevation by 42 meters. What is the new elevation with respect to base camp?

**Subtract.**

8.  $10 - (-3)$

9.  $-9 - (-9)$

10. The temperature falls from  $3^{\circ}\text{C}$  to  $-4^{\circ}\text{C}$ . What is the difference in these temperatures?

**Multiply.**

11.  $7 \cdot (-4)$

12.  $-2(-5)(-3)$

**Divide, if possible.**

13.  $-12 \div (-4)$

14.  $-18 \div 6$

15.  $\frac{-16}{8}$

16.  $0/(-10)$

**Evaluate the expression when  $r = -7$ ,  $s = 2$ , and  $t = -5$ .**

17.  $s + t$

18.  $t + s - r$

19.  $s^2 - rt$

20.  $\left| \frac{r+1}{s} \right|$

**Use mental math to solve the equation.**

21.  $n + (-8) = 5$

22.  $8 - d = 14$

**Find the next two numbers in the pattern.**

23. 6, -12, 24, -48, ...

24. -2, 20, -200, 2000...

25. The table shows the temperature in Des Moines, Iowa, for certain times during a particular day.

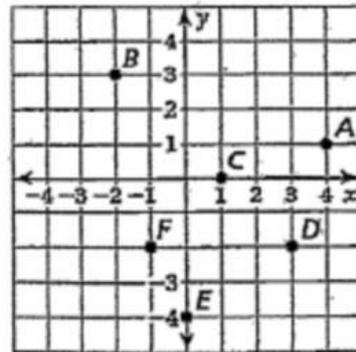
Time	3 A.M.	8 A.M.	1 P.M.	5 P.M.	10 P.M.
Temperature	-15°F	-6°F	22°F	10°F	-11°F

- What are the high and low temperatures for the day?
- Find the range of temperatures for the day.
- Find the change in temperature from 5 P.M. to 10 P.M.

- d. Based on the given five temperatures, what is the average temperature for the day?
- e. Explain why your answer to part (d) is not an accurate average temperature for the day.

26. Write an ordered pair corresponding to the point.

- a. Point A
- b. Point B
- c. Point C
- d. Point D
- e. Point E
- f. Point F



27. Which point in Exercise 26 is located in Quadrant III?

28. The pool is located at (0,0).

- a. To get to your house from the pool, you walk 3 blocks west and 1 block north. What ordered pair corresponds to the location of your house?
- b. What quadrant is your house located in?

## Part 2: Rational Numbers and Algebra

Example:  $\frac{3}{4} \rightarrow 3 \div 4$

$$\begin{array}{r} .75 \\ 4 \overline{) 3.00} \\ \underline{- 28} \phantom{0} \\ 20 \\ \underline{- 20} \\ 0 \end{array}$$

$\frac{3}{4} = 0.75$

### Decimal $\rightarrow$ Fraction

$$.15 = \frac{15}{100} = \frac{3}{20}$$

The last digit is in the hundredths place.

Use the place value of the last digit to write as fraction with denominator of 10, 100, 1000 etc. Then simplify the fraction if possible.

**Write the rational number as a decimal.**

1.  $-3\frac{13}{20}$

2.  $-\frac{3}{11}$

**Write the decimal as a fraction or mixed number in simplest form.**

3. 3.42

4. -0.35

5. Your skateboard ramp is  $2\frac{3}{8}$  feet high. Your friend's skateboard ramp is  $2\frac{2}{5}$  feet high. Which skateboard ramp is higher?

**Add or subtract. Write fractions in simplest form.**

6.  $5.73 - (-3.56)$

7.  $-\frac{5}{3} + 2\frac{1}{3}$

8. A gallon jug of milk is  $\frac{3}{4}$  full. After breakfast, the jug is  $\frac{1}{12}$  full. Find the difference of the amount before breakfast and after breakfast.

9. You buy a bag of dog food for \$12.59 and a bottle of dog shampoo for \$4.75. How much more did the dog food cost than the shampoo?

**Multiply. Write fractions in simplest form.**

10.  $\left(-\frac{2}{5}\right)\left(-1\frac{1}{4}\right)$

11.  $0.15 \times (-0.6)$

**Divide. Write fractions in simplest form.**

12.  $-4.2 \div 12$

13.  $-\frac{2}{7} \div \left(-\frac{8}{21}\right)$

14. How many  $\frac{2}{3}$ -ounce packages of peanuts can be made with 8 ounces of peanuts? Explain how you found your answer.

# SOLVING EQUATIONS

To solve equations find the value of the variable that makes the equation true using **inverse** operations

$$\begin{array}{r} x + 23 = 90 \\ -23 \quad -23 \\ \hline x = 67 \end{array}$$

Undo addition using subtraction

$$\begin{array}{r} x - 12 = 74 \\ +12 \quad +12 \\ \hline x = 86 \end{array}$$

Undo subtraction using addition

$$\begin{array}{r} 4x = 48 \\ \div 4 \quad \div 4 \\ \hline x = 12 \end{array}$$

Undo multiplication using division

$$\begin{array}{r} \frac{x}{3} = 18 \\ \cdot 3 \quad \cdot 3 \\ \hline x = 54 \end{array}$$

Undo division using multiplication

**Solve the equation. Check your solution.**

15.  $n - 6 = 21$

16.  $-8.3 = d + 4.7$

17.  $p + 1\frac{3}{4} = 4\frac{5}{8}$

18.  $-2 = \frac{w}{-5}$

19.  $5h = 40$

20.  $-0.5x = -4.3$

# Clue Words

<u>Adding</u>	<u>Multiplying</u>	<u>Answer</u>
Sum Gain Increased More Altogether Plus Total Combined Perimeter	Product Of Distribute Twice (x2) Double (x2) 7n 7(6) (per/each)	Solve Find Express Evaluate Calculate Model Solution Simplify
<u>Subtracting</u>	<u>Dividing</u>	<u>Equal</u>
Difference Elapsed Deduct Used Less Minus Passed Remain Exceed	Bigger Smaller Shorter Taller Longer Loss Least Has left Decreased	Quotient Division Average Factor Share Half (-2) 12/2 (per/each)
		<u>Reverse the order</u>
		Than From

**Rewrite the verbal sentence as an equation. Then, solve.**

21. 6 more than a number,  $w$ , is 2.

22. The product of  $\frac{3}{4}$  and a number,  $s$ , is  $\frac{3}{5}$ .

**Write an equation for the situation. Then, solve.**

23. The temperature is  $-4^{\circ}\text{F}$ . A high-pressure front increases the temperature to  $8^{\circ}\text{F}$ . By how many degrees did the temperature increase?

24. One eighth of the students in the seventh grade are in the school band. There are 44 seventh grade students in the school band. Find the number of students in the seventh grade.

## Solving Two-Step Equations

1. Add or subtract to isolate the variable term.
2. Multiply or divide to solve for the variable.
3. Check your solutions.

Example:

$$3x + 5 = -16$$

$$\begin{array}{r} -5 \quad -5 \\ 3x + 5 = -16 \\ \hline 3x = -21 \end{array} \quad \text{Subtract}$$

$$3x = -21$$

$$\begin{array}{r} 3x = -21 \\ \hline \frac{3x}{3} = \frac{-21}{3} \end{array} \quad \text{Divide}$$

$$x = -7$$

$$3(-7) + 5 = -16 \quad \text{Check}$$

**Solve the equation. Check your solution.**

25.  $3d - 8 = 13$

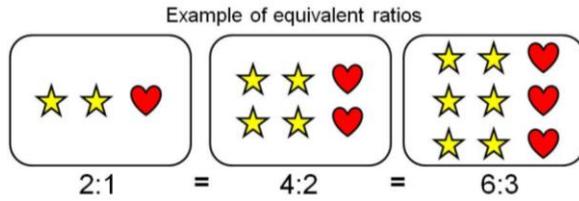
26.  $-7 = \frac{z}{2} + 1$

27.  $2y - 3y = 5$

28.  $-2.9 = 3f + 4.3$

29. A rectangular garden has a length of 12 feet. You need 36 feet of fencing to enclose the garden. What is the width of the garden? Explain how you found your answer.

## Part 3: Ratios and Proportions



Generating equivalent ratios

eg

$$\begin{array}{c} 3 : 4 \\ = \\ 15 : 20 \end{array} \begin{array}{l} \times 5 \\ \times 5 \end{array}$$

eg

$$\begin{array}{c} 12 : 8 \\ = \\ 6 : 4 \end{array} \begin{array}{l} +2 \\ +2 \end{array}$$

$$\begin{array}{r} 5x \\ \frac{5}{12} = \frac{15}{x} \\ \frac{5x}{12} = \frac{15 \cdot 180}{x} \\ 5x = 180 \\ \frac{5x}{5} = \frac{180}{5} \\ x = 36 \end{array}$$

**Write the ratio as a fraction in simplest form.**

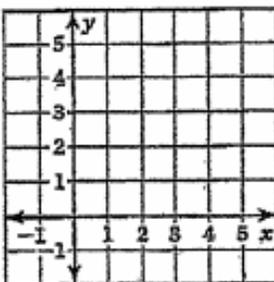
- 15 girls to 6 boys
- 24 players: 3 teams

**Find the unit rate.**

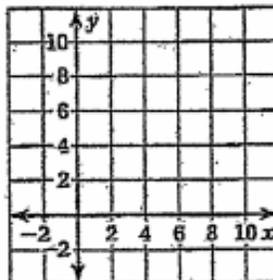
- 405 rotations in 5 minutes
- 72 ounces for 12 servings

**Graph the line that passes through the two points. Then, find the slope of the line.**

- (0,0) & (3,2)



- (4,4) & (8,8)



**Tell whether the ratios form a proportion.**

7.  $\frac{8}{24}, \frac{5}{15}$

8.  $\frac{3}{7}, \frac{12}{21}$

9. You can buy 5 stickers for \$3. Write a proportion that gives the cost,  $c$ , if you buy 12 stickers.

**Solve the proportion.**

10.  $\frac{2}{3} = \frac{n}{12}$

11.  $\frac{33}{p} = \frac{3}{28}$

12.  $\frac{k}{6} = \frac{15}{18}$

13.  $\frac{2}{3} = \frac{3}{q}$

**Convert and complete the statement. Round to the nearest hundredth, if necessary.**

14. 3 in.  $\approx$    ? cm

15. 4 L  $\approx$    ? qt

16. 30 mi/h  $\approx$    ? km/h

17. 40 oz  $\approx$    ? kg

18. Use the table to find the rate.

Quarters	2	3	4	6
Minutes	30	45	60	90

19. Your baseball team has won 6 games and lost 4 games. If the team does not lose any more games, how many games must the team win to have a win : loss ratio of 2 : 1? Explain your answer.

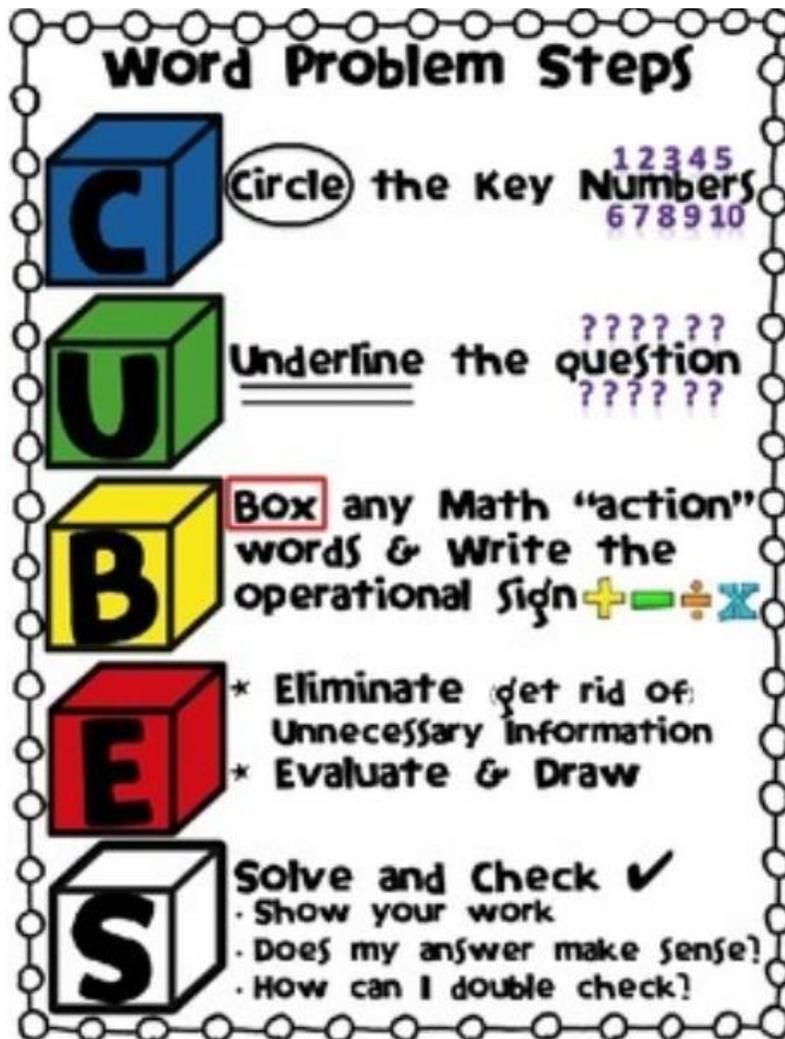
20. It costs \$145 for 10 people to attend a concert. How much does it cost a group of 8 people?

21. The weekly cost per person to rent a cottage on a lake varies inversely with the number of people who share the cost. When four people share the cost, each one pays \$312.

a. Write an equation relating the cost per person,  $c$ , and the number of people,  $n$ , who share the cost.

b. If six people share the cost instead of four, how much does the cost per person decrease?

## Part 4: Logic & Word Problems



**Write an equation for the situation. Then, solve.**

1. Joey is putting all of his trophies onto 7 shelves. If he places 6 trophies on each shelf but still has 2 trophies left over, how many trophies does he have?
2. Angie read 3 books in 4 days, and each book contained 280 pages. If Angie read the same number of pages each day, how many pages did she read per day?

3. Mike put 304 baseballs into 8 trash bins. He put the same number of baseballs in each bin. He took 5 trash bins of baseballs to the baseball field. How many baseballs did Mike take?
  
  
  
  
  
  
  
  
  
  
4. Workers Inc. just bought 14 boxes of pens to put in their storage room for employees to use as needed. Each box contains 50 pens. If each of the 33 employees working for Workers Inc. takes 4 pens when they are first brought into the office, how many pens will be left in the storage room?
  
  
  
  
  
  
  
  
  
  
5. John has 9 boxes of apples. Each box holds 16 apples. If 7 of the boxes are full, and 2 of the boxes are half full, how many apples does John have?
  
  
  
  
  
  
  
  
  
  
6. The temperature outside is  $-5^{\circ}\text{F}$ , and the wind chill is  $-12^{\circ}\text{F}$ . What is the difference between the temperature and the windchill?
  
  
  
  
  
  
  
  
  
  
7. Jena has a rope that is  $4\frac{1}{4}$  inches long. If she divides the rope into sections that are exactly  $\frac{1}{4}$  of an inch in length, how many sections will she have?

8. Mrs. Jones decided to buy some pencils for her class. She bought 3 packages of pencils, and each package contained 72 pencils. There are 24 students in her class and she divided up the pencils so that each student had the same amount of pencils. If there were no pencils left over, how many pencils did each student get?
9. Griffin ordered a pair of sneakers online. He had a \$16 credit that he applied toward the purchase and then he used a credit card to pay for the rest of the cost. If the shoes cost \$80, how much did Griffin charge to his credit card when he bought the sneakers?
10. Caleb had 27 video games. He bought 8 more from a garage sale. He then sold  $\frac{1}{35}$  of his games to a used video game store. How many video games did he sell?
11. For a scavenger hunt, Jim's mom distributed a bag of 725 jelly beans evenly into 29 plastic containers and hid them around the yard. If, after the hunt, Jim has a total of 275 jelly beans, then how many of the plastic containers did he find?

12. Sandra, Robert, and some other friends had a total of \$73. Sandra spent \$28 on videos and Robert spent \$14 on videos. How much money did the group have after Sandra and Robert bought the videos?
13. Jimmy is writing a paper for one of his classes. The paper has to be 3,000 words long and so far, he has only written 696 words. If he has 6 more days to write his paper and wants to write the same number of words each day, then how many words must he write per day to finish the paper?
14. Lindsey went skydiving. When she jumped out of the plane, its elevation was 13,000 feet. She was in free fall for 10,000 feet and then she deployed her parachute. At what elevation did Lindsey deploy her parachute?
15. On his bookshelf, Adam has the difference between two-thirds of Brett's books and two-thirds of Charlie's books. If Brett has 72 books and Charlie has 27 books, how many books does Adam have?

16. Fredo has a coupon for \$1.00 off the price of a loaf of bread at the grocery store. After he arrived at the store, he found out the bread had already been marked down \$2.00. What is the total discount on the price of the bread?
17. Carla, Patricia, and Angelina went on a car trip together, and they took turns driving. When they reached their destination, Carla and Patricia had driven a total of 259 miles, and Angelina and Patricia had driven a total of 255 miles. If Carla drove 101 miles, who drove the most miles?
18. The temperature of a city at sunset was  $-3^{\circ}\text{F}$ . Overnight, the temperature decreased by  $13^{\circ}\text{F}$ . What was the lowest temperature overnight in that city?
19. A pet store sold 245 cans of cat food last week for \$90.65. What was the price per can?
20. Sam, James, and Leonard participated in a fundraiser at their school. Sam sold 23 candles. Together, Sam and James sold 51 candles. Together, James and Leonard sold 54 candles. How many candles did Leonard sell?