

# Getting Ready for Big Ideas MS Course 2

1. Decimals
2. Fractions
3. Order of Operations
4. Coordinate Plane
5. Ratios and Proportions
6. Prime Factorization
7. Area of Triangles

# Decimals

**Adding/Subtracting Decimals:** Use a vertical format to add or subtract decimals. Begin by lining up the decimal points and use zeros as place holders. Borrow as necessary.

**Multiplying Decimals:** Multiply decimals as you would whole numbers, then place the decimal point in the product. The number of decimal places is the sum of the number of decimal places in the factors.

**Dividing Decimals:** To divide decimals, multiply both the divisor and the dividend by the power of 10 that will make the divisor a whole number.

Ex 1 –  $0.283 + 0.54$

$$\begin{array}{r} 0.283 \\ + 0.540 \\ \hline 0.823 \end{array}$$

Ex 2 – Find the product of 4.94 and 0.45

$$\begin{array}{r} 4.94 \\ \times 0.45 \\ \hline 2470 \\ 1976 \\ \hline 2.2230 \end{array}$$

Ex 3 – Find the quotient of 7.848 and 0.24

$$0.24 \overline{)7.848}$$

Solution: 32.7

**Find the sum or difference.**

1.  $3.4 + 0.91$

4.  $8.6 - 2.92$

2.  $0.5 + 0.8$

5.  $1.7 - 0.49$

3.  $4.63 + 23.5$

6.  $2 - 0.53$

**Find the product or quotient.**

7.  $0.5 \times 0.14$

11.  $0.018 \div 0.5$

8.  $1.6 \times 0.9$

12.  $42 \div 0.42$

9.  $0.24 \times 0.13$

13.  $0.91 \div 0.7$

10.  $0.3 \times 0.4 \times 0.2$

14.  $0.459 \div 0.09$

# Fractions

A mixed number is the sum of a whole number and a fraction. An improper fraction is any fraction in which the numerator is greater than the denominator.

To add or subtract fractions, the fractions must have a common denominator.

To multiply fractions, multiply the numerators and multiply the denominators.

Ex 1 – Write  $1\frac{9}{10}$  as an improper fraction.

$$= \frac{1(10)+9}{10} = \frac{19}{10}$$

Ex 2 – Find the sum of  $\frac{2}{5}$  and  $\frac{3}{4}$

$$\frac{2}{5} + \frac{3}{4}$$

**Write the original problem**

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

**Get a common denominator**

$$\frac{8}{20} + \frac{15}{20}$$

**Multiply**

$$\frac{23}{20} = 1\frac{3}{20}$$

**Simplify**

1. Write  $5\frac{1}{3}$  as an improper fraction

**Find the sum or difference.**

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

2. Write  $8\frac{3}{5}$  as an improper fraction

6.  $2\frac{3}{8} + 3\frac{1}{2}$

3. Write  $\frac{14}{3}$  as a mixed number

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

4. Write  $\frac{19}{6}$  as a mixed number

8.  $5\frac{1}{2} - 3\frac{2}{5}$

**Find the product.**

9.  $\frac{1}{4} \times \frac{3}{8}$

12.  $2\frac{1}{4} \times 1\frac{1}{2}$

10.  $1\frac{1}{3} \times 1\frac{1}{4}$

13.  $1\frac{2}{3} \times 2\frac{1}{2}$

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

14.  $1\frac{3}{4} \times 2\frac{1}{5}$

# Order of Operations

Parentheses	Exponents	Multiply or Divide	Add or Subtract
( )	$\sqrt{x}$ or $x^2$	$\times$ or $\div$	$+$ or $-$

**Evaluate  $(5 + 3)^2 \div 2 \times 3$ .**

$$= (8)^2 \div 2 \times 3 \quad \text{Add within the parentheses}$$

$$= 64 \div 2 \times 3 \quad \text{Evaluate the power}$$

$$= 32 \times 3 \quad \text{Divide}$$

$$= 96 \quad \text{Multiply}$$

**Evaluate the expression.**

1.  $3 \times 3 + 4 \times 5$

4.  $10 + 9 \div 3 - 6$

2.  $6 \times 5 - 7 \times 2$

5.  $6 \times 4 + 3 \times 2$

3.  $2 + 8 \times 2 - 5$

6.  $3 \times (3 \times 4) \div 4$

7.  $3^2 + 2(8 + 6) + 15 \div 5$

9.  $(6 \div 3 + 5) \times (11 - 4)$

8.  $18 - (21 - 5) \div (22 - 18)$

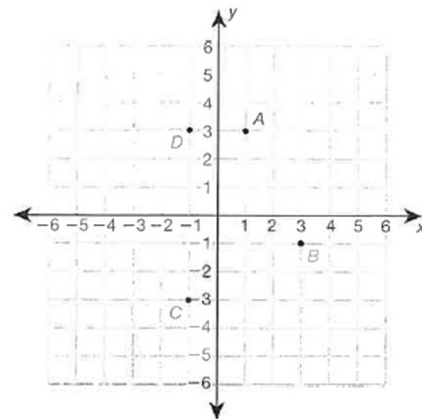
10.  $11 \times 4 - (6 + 3 + 13) \div 2$

# Coordinate Plane

Every point on a coordinate plane is named with two numbers. The first number shows how far left or right; the second number shows how far up or down.

**Complete the following.**

1. Which point to the right has the coordinates  $(3, -1)$ ?



2. What are the coordinates of point D?

3. Draw the coordinate  $(5, -2)$  on the graph above and label it E.

4. What are the coordinates of the point halfway between  $(-1, 1)$  and  $(3, 1)$ ?

5. The coordinates of three vertices of a square are  $(2, 2)$ ,  $(-1, 2)$ , and  $(-1, -1)$ . What are the coordinates of the fourth vertex?



**The coordinates of a rectangle are  $(1, -1)$ ,  $(4, -1)$ ,  $(4, 4)$ , and  $(1, 4)$ .**

6. How many units is the perimeter of the rectangle?

7. How many square units is the area of the rectangle?

# Ratios and Proportions

A ratio is the relationship between two numbers, represented as a quotient. A proportion is a true statement that two ratios are equal. To find a missing term in a proportion, find the number that is multiplied by the first term to get the second term.

Ex – The ratio of boys to girls in the class was 3 to 2. If there were 8 girls in the class, how many boys were there?

$$\frac{2}{3} = \frac{8}{x}$$

**Original proportion**

$$x = 12$$

**Scale factor of 4 utilized**

There were 12 boys in the class.

**Complete the following.**

1. Which ratio forms a proportion with  $\frac{4}{5}$ ?

- a.  $\frac{8}{9}$
- b.  $\frac{16}{20}$
- c.  $\frac{14}{15}$
- d.  $\frac{16}{25}$

2. Three is to seven as nine is to what number?

3. Nine is to five as eighteen is to what number?

4. Six is to five as what number is to twenty-five?

5. The ratio of red flowers to white flowers in the garden was 4 to 3. If there were 30 white flowers, how many red flowers were there?

6. The ratio of girls to boys on the soccer team was 3 to 5. If there were 10 boys on the team, how many girls were there?

7. The ratio of vans to cars in the parking lot was 2 to 4. If there were 24 cars in the lot, how many vans were there?
8. The ratio of white chalk to colored chalk in the box was 6 to 4. If there were 16 pieces of colored chalk in the box, how many pieces of white chalk were there?

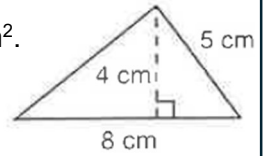
# Area of Triangles

The area of any triangle is half of a parallelogram with the same base and height. The height is perpendicular to the base. Area is expressed in square units.

**Area Formula:**  $A = \frac{1}{2}bh$

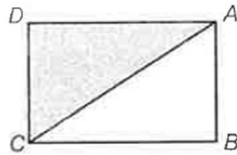
Ex 1 – Find the area of the triangle below.

$$A = \frac{1}{2}bh = \frac{1}{2}(8)(4) = 16 \text{ cm}^2.$$

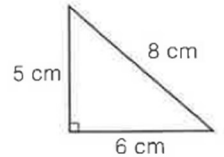


**Complete the following.**

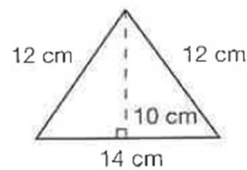
1. Figure ABCD is a rectangle. Segment AD is 5 cm long, segment DC is 4 cm long, and segment AC is 6 cm long. What is the area of triangle ADC?



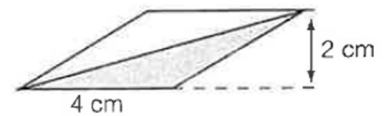
3. What is the area of the triangle below?



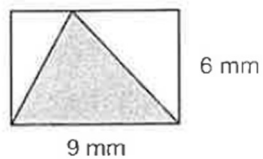
2. What is the area of the triangle below?



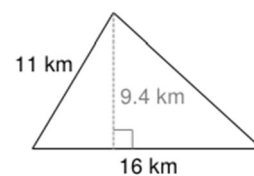
4. What is the area of the shaded part of the parallelogram below.



5. The area of the shaded part of the rectangle below is half of the area of the rectangle. What is the area of the area of the shaded triangle?



6. What is the area of the triangle below?



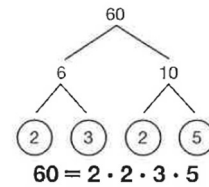
# Prime Factorization

A prime number has only two factors – itself and 1.

A composite number has more than two factors.

Prime factorization is writing a composite number as a product of its prime factors.

Ex – Find the prime factorization of 60.



**Solve each equation.**

1. Find the prime factorization of 28.

4. Find the prime factorization of 54.

2. Find the prime factorization of 45.

5. Find the prime factorization of 35.

3. Find the prime factorization of 32.

6. Find the prime factorization of 72.

7. Find the prime factorization of 81.

9. Find the prime factorization of 660.

8. Find the prime factorization of 80.