

Topics

1. Adding and subtracting fractions
2. Graphing a point in the Rectangular Coordinate System
3. Solving linear equations

1. Adding and subtracting fractions

Fractions with like denominators

Procedure:

1. Add or subtract the numerators.
2. Write the result over the like denominator.
3. Simplify to lowest terms, if possible.

Example 1: $\frac{3}{10} + \frac{5}{10} = \frac{3+5}{10} = \frac{8}{10} = \frac{4}{5}$

Example 2: $\frac{2}{9} - \frac{8}{9} = \frac{2-8}{9} = \frac{-6}{9} = -\frac{2}{3}$

Note: You can write the negative in the numerator or in front of the fraction.

Practice: Find the sum or difference. Simplify to lowest terms, if possible.

1) $\frac{1}{12} + \frac{5}{12}$

2) $\frac{4}{15} + \frac{7}{15} + \frac{1}{15}$

3) $\frac{5}{7} - \frac{2}{7}$

4) $\frac{9}{8} - \frac{1}{8}$

Tip:

The top of the fraction is the numerator.

The bottom of the fraction is the denominator.

“Like” or “common” denominators means the fractions have the same denominator.

We add or subtract the numerators only.

Never add or subtract the denominators!

Least common denominators

To add fractions, they must have the same denominator. This denominator is known as the least common denominator or LCD. It is also known as the least common multiple or LCM.

Procedure:

1. List multiples of each denominator.
2. The smallest number that is in both lists is the LCD.

Example: Find the LCM of 10 and 12.

Multiples of 10: 10, 20, 30, 40, 50, 60, 70, 80, ...

Multiples of 12: 12, 24, 36, 48, 60, 72, ...

Since 60 is the smallest number in both lists, 60 is the LCM or LCD.

Practice: Find the least common multiple.

- 1) 5 and 7
- 2) 8 and 10
- 3) 30 and 42

Fractions with unlike denominators

Procedure:

1. Find the least common denominator (LCD). This is the smallest number that is a multiple of both denominators.
2. Multiply numerator and denominator of each fraction by the missing factors to get the LCD in each denominator.
3. Add or subtract as with like denominators.

Example: $\frac{7}{15} + \frac{1}{6}$

First, find the LCD. The smallest number that is a multiple of both 15 and 6 is 30, so that is the LCD.

Next, multiply the numerator and denominator of each fraction by the number needed to get the LCD in each denominator.

$$\frac{2}{2} \cdot \frac{7}{15} + \frac{5}{5} \cdot \frac{1}{6} = \frac{14}{30} + \frac{5}{30} = \frac{19}{30}$$

Practice: Find the sum or difference. Simplify to lowest terms, if possible.

- 1) $\frac{1}{3} + \frac{2}{11}$
- 2) $\frac{7}{10} - \frac{5}{8}$

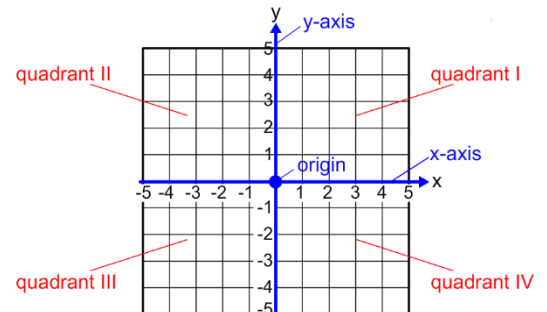
Tip:

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

2. Graphing a point in the Rectangular Coordinate System (also known as the x,y plane)

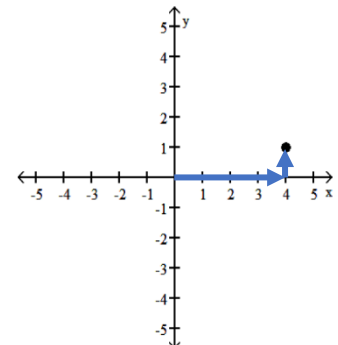
Introduction to the Rectangular Coordinate System

- Points in the x,y plane have two parts, an x -coordinate and a y -coordinate, written as an ordered pair in the form (x, y) .
- The x -coordinate is the number of units a point is located horizontally from the center or origin.
- The y -coordinate is the number of units a point is located vertically from the origin.
- The x -axis is the line separating the top of the plane (positive y values) from the bottom (negative y values).
- The y -axis is the line separating the right of the plane (positive x values) from the left (negative x values).
- The x -axis and y -axis separate the x,y plane into 4 quadrants, numbered with Roman numerals I, II, III, IV starting in the top right and going counter-clockwise.
- To plot a point, start at the origin and move horizontally to the x -coordinate and vertically to the y -coordinate.



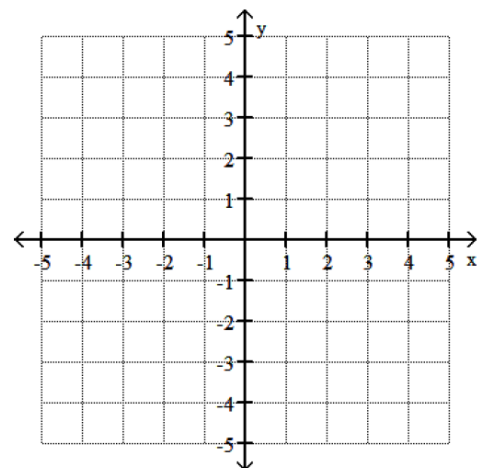
Example: Plot $(4,1)$.

To plot the point $(4, 1)$, start at the origin and move 4 units to the right and then 1 unit up.



Practice: Plot each point and indicate in which quadrant or on which axis they lie.

- 1) $(3, 5)$
- 2) $(-2, 4)$
- 3) $(1, -3)$
- 4) $(-3, -4)$
- 5) $(0, -2)$
- 6) $(4, 0)$



3. Solving linear equations

Procedure:

1. Clear all parentheses by using the distributive property.
2. Combine all like terms on each side of the equation.
3. Move the variables by addition or subtraction to one side of the equation.
4. Move the constant terms by addition or subtraction to the other side of the equation.
5. Divide both sides by the coefficient of the variable.
6. Check your solution in the original equation.

TIP:

The coefficient is the number multiplied by the variable.

For example: $3x$

3 is the coefficient

x is the variable

Example: Solve $5(x - 2) = 2x + 8$.

Distribute:	$5x - 10 = 2x + 8$
Subtract $2x$ from both sides of the equation:	$3x - 10 = 8$
Add 10 to both sides of the equation:	$3x = 18$
Divide both sides by 3:	$x = 6$

Practice: Solve each equation for the indicated variable.

1) $-3x + 4 = 19$

2) $\frac{m}{6} = 2$

3) $9b + 2 = 2b + 23$

4) $3(y + 4) = 17 - 2y$

5) $10z + 8 - 4z = -2(12 - z)$

Topic 1 – Adding and subtracting fractions

Fractions with like denominators

- 1) $\frac{1}{2}$
- 2) $\frac{4}{5}$
- 3) $\frac{3}{7}$
- 4) 1

Topic 3 – Solving linear equations

- 1) $x = -5$
- 2) $m = 12$
- 3) $b = 3$
- 4) $y = 1$
- 5) $z = -8$

Least common denominators

- 1) 35
- 2) 40
- 3) 210

Fractions with unlike denominators

- 1) $\frac{17}{33}$
- 2) $\frac{3}{40}$

Topic 2 – Graphing a point in the Rectangular Coordinate System

