

Math Placement Test Review

Simplifying Expression

- **Combine like terms**
- **Use distributive property to remove parenthesis**
- **PEMDAS!!!!!!!!!!!!!!**

1. Simplify: $-12p + 45 - 7p$
2. Simplify: $4[m - 2(2m + 3)]$
3. Simplify: $2(5 - 3)^2 + 2^2 \div 2$
4. Simplify: $\frac{3x - (-4)}{7}$
5. Solve for x: $5x - 8 = 12$
6. Solve for b: $b + 4b = -90$
7. Solve for t: $3(2t - 6) = 2(3t - 9)$
8. Solve for y: $3(y - 2) - 16 = 8y$

Equations and Problem Solving:

- **Decide which unknown quantity the variable will represent**
- **Then express the other unknown quantity or quantities in terms of that variable**

1. The length of a rectangle is 6 inches more than its widths. The perimeter of the rectangle is 24 inches. What is the length of the rectangle?
2. John is 5 years older than Jack. The sum of their ages is 25. How old is John and Jack?
3. The sum of three consecutive integers is 915. What are the integers?
4. The width of the rectangles is double the width. The perimeter is 48 inches. What are the dimensions of the rectangle?

Inequalities:

- **Closed dot: \leq or \geq**
- **Open dot: $>$ or $<$**

Solve and graph on a number line:

1. $3n + 5 > -1$
2. $4k - 1 \leq -3$
3. $-3 \leq z - 1 \leq 3$
4. $2t \leq -4$ or $7t \geq 49$
5. $-2 \leq 3a - 8 < 4$

6. $4 + \frac{x}{2} > 2x$
7. $0.5x - 2 \geq -4x + 7$
8. $6(c - 1) \leq -18$

Linear Equations:

Slope Intercept Form: $y = mx + b$

$$m = \text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}} \quad \text{when: } (x_1, y_1) \quad (x_2, y_2) \quad b = y - \text{intercept}$$

Standard Form: $Ax + By = C$

when $x = 0$, find $y - \text{intercept}$ $(0, y)$

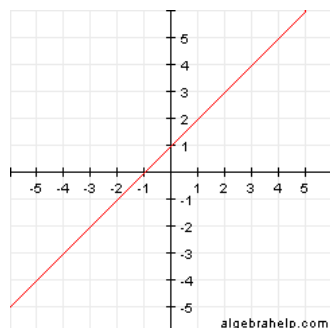
when $y = 0$, find $x - \text{intercept}$ $(x, 0)$

Point Slope Form: $y - y_1 = m(x - x_1)$ *when given (x_1, y_1)*

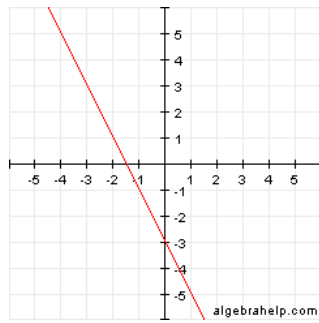
Parallel Lines: Two linear equations with the **SAME** slope

Perpendicular Lines: Two linear equations with **INVERSE RECIPROCAL** slopes

1. Find the slope of a line $(-3, 7)$ and $(-12, 15)$
2. Find the slope of a line $(10, 12)$ $(12, 15)$
3. Write an equation with $m = -7$ $b = \frac{1}{2}$
4. Write equation in standard form: $y = \frac{3}{5}x + 7$
5. Write an equation $m = 2$ and passes through line $(1, -2)$
6. Write an equation $m = -\frac{1}{2}$ and passes through line $(1, -2)$
7. Find the slope of the line



8. Write an equation for the line



9. Write an equation for a line parallel to $y = \frac{2}{7}x - 4$ and passes through point $(8, 3)$

10. Write an equation for a line parallel to $2x + 3y = 12$ and passes through point $(-1, -5)$

11. Write an equation for a line perpendicular to $\frac{2}{5}x = y$ and passes through point $(2, 4)$

12. Write an equation for a line perpendicular to $3x - 6y = -18$ and passes through point $(6, 7)$

13. Write an equation for a line that passes through coordinates $(-1, 2)$ and $(7, 6)$

System of Equations:

- **two or more linear equation**
- **a point where the lines intersect is a solution of the system**
- **NUMBER OF SOLUTIONS OF SYSTEMS OF LINEAR EQUATIONS**
 - **Different Slopes: The lines INTERSECT so there is ONE solution**
 - **Same Slope with Different Y-Intercepts: The lines are PARALLEL so there are NO solutions**
 - **Same Slope and Same Y-Intercept: The lines are the SAME so there are INFINITE solutions**
- **can solve a system of equations**
 - **Graphing**
 - **Substitution**
 - **Elimination**

1. Solve the system of equations: $y = 4x - 7$ and $y = 2x + 9$

2. Solve the system of equations: $y + 6 = 2x$ and $4x - 10y = 4$

3. Solve the system of equations: $8x + 2y = -2$ and $y = -5x + 1$

4. Solve the system of equations: $4x + y = 8$ and $-3x - y = 0$

5. Solve the system of equations: $x + y = 10$ and $-x - 2y = -14$

Simplifying Exponents

- **Multiply Exponents with the same base: ADD EXPONENTS**

- $x^a x^b = x^{a+b}$

- **Divide Exponents with the same base: SUBTRACT EXPONENTS**

- $\frac{x^a}{x^b} = x^{a-b}$

- **Negative Exponent**

- $x^{-a} = \frac{1}{x^a}$

- **To raise a product or dividend to a power, factor the power**

- $\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$

- $(ab)^x = a^x \cdot b^x$

1. $\frac{21w^2}{7w}$

2. $\frac{5ab^5}{b^8}$

3. $(b^7)(b^9)$

4. 7^{-2}

5. $(3a^4)^3$

6. $\frac{35x^6y^4y^2z}{22x^{10}y^3}$

Polynomials

- **Combine like terms**
- **Distributive Property if needed**
- **FOIL: First-Outer-Inner-Last**

1. $(-4b^5 + 3b^3 - b + 10) + (3b^5 - b^3 + b - 4)$

2. $(3g^4 + 5g^2 + 5) + (5g^4 - 10g^2 + 11g)$

3. $8x(2 - 5x)$

4. $5m(3m + m^2)$

5. $(x + 3)(x + 5)$

6. $(2m^2 + 5)(2m^2 - 5)$

7. $(w - 4)(w + 4)$

Factoring Polynomials

- FOIL
- Perfect square trinomial
 - $(a + b)^2 = (a + b)(a + b) = a^2 + 2ab + b^2$
 - $(a - b)^2 = (a - b)(a - b) = a^2 - 2ab + b^2$
 - $a^2 - b^2 = (a - b)(a + b)$
- For a polynomial of 4 or more terms, find the GCF of the first two terms and the GCF of the last two terms and group terms and look for a common binomial group

1. $x^2 + 3x + 2$
2. $2x^2 - x - 3$
3. $4t^2 - 121$
4. $6x^2 + 10x + 4$
5. $15y^2 + 16y + 1$
6. $x^2 + 6x + 9$
7. $6x^3 + 3x^2 + 8x + 4$
8. $15x^3 + 11x^2 - 45x - 33$

Quadratic Formula

- Use when polynomial is not easily factored and to solve an equation
- If $ax^2 + bx + c = 0$ and $a \neq 0$ then, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

1. Solve for x: $2x^2 + 5x + 3 = 0$
2. Solve for x: $3x^2 + 47x = -30$
3. Solve for x: $2x^2 - 24 + 33 = 0$
4. Solve for x: $3x^2 - 11x = 2$