

## Algebra One Worksheets Questions and Answers PDF

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### Part 1: Building a Foundation

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**What is the degree of the polynomial  $(3x^4 - 2x^3 + x - 5)$ ?**

*Hint: Consider the highest exponent of the variable.*

- A) 1
- B) 2
- C) 3
- D) 4 ✓

■ The degree of the polynomial is determined by the highest power of  $x$ , which is 4.

**Which of the following are like terms? Select all that apply.**

*Hint: Like terms have the same variable raised to the same power.*

- A)  $(5x^2)$  ✓
- B)  $(3x)$
- C)  $(7x^2)$  ✓
- D)  $(2x)$

■ Like terms include terms that have the same variable and exponent.

**Explain the difference between a linear equation and a quadratic equation.**

*Hint: Consider the highest power of the variable in each type of equation.*

**A linear equation has a degree of 1, while a quadratic equation has a degree of 2.**

**List the steps to solve a linear equation in one variable.**

*Hint: Think about isolating the variable.*

1. Step 1

**Simplify both sides of the equation.**

2. Step 2

**Isolate the variable on one side.**

3. Step 3

**Solve for the variable.**

**The steps typically include simplifying both sides, isolating the variable, and solving for the variable.**

**Which property is used in the expression  $(a(b + c) = ab + ac)$ ?**

*Hint: Think about how terms are distributed in multiplication.*

- A) Commutative Property
- B) Associative Property

- C) Distributive Property ✓  
 D) Identity Property

■ This expression demonstrates the Distributive Property.

## Part 2: Understanding and Application

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If  $f(x) = 2x + 3$ , what is  $f(4)$ ?

Hint: Substitute 4 into the function for  $x$ .

- A) 5  
 B) 8  
 C) 11 ✓  
 D) 15

■ To find  $f(4)$ , substitute 4 into the function and simplify.

Which of the following statements about the function  $f(x) = x^2 - 4$  are true? Select all that apply.

Hint: Consider the properties of quadratic functions.

- A) The graph is a parabola. ✓  
 B) The vertex is at the origin.  
 C) The function has no real roots.  
 D) The function is symmetric about the y-axis. ✓

■ The true statements relate to the characteristics of the quadratic function.

Describe how you would graph the inequality  $y > 2x + 1$  on a coordinate plane.

Hint: Think about the line and the area it divides.

Graph the line  $y = 2x + 1$  and shade the area above it.

Solve for  $x$  in the equation  $3x - 7 = 2x + 5$ .

Hint: Isolate  $x$  on one side of the equation.

- A) 12  
 B) -12  
 C) 7  
 D) -7 ✓

To solve for  $x$ , rearrange the equation and simplify.

Which of the following are solutions to the inequality  $x^2 - 9 < 0$ ? Select all that apply.

Hint: Consider the values that make the expression negative.

- A)  $x = -4$   
 B)  $x = -2$  ✓  
 C)  $x = 0$   
 D)  $x = 3$  ✓

The solutions are the values of  $x$  that satisfy the inequality.

A rectangle has a length that is 3 times its width. If the perimeter is 48 units, find the dimensions of the rectangle.

Hint: Use the perimeter formula to set up an equation.

Let width be  $w$ , then length is  $3w$ . Set up the equation  $2(w + 3w) = 48$ .

### Part 3: Analysis, Evaluation, and Creation

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What is the axis of symmetry for the quadratic function  $(y = x^2 - 6x + 8)$ ?

Hint: Use the formula  $(x = -\frac{b}{2a})$ .

- A)  $(x = -3)$
- B)  $(x = 3)$  ✓
- C)  $(x = 6)$
- D)  $(x = -6)$

■ The axis of symmetry can be found using the vertex formula.

Analyze the polynomial  $(x^3 - 4x^2 + 4x)$ . Which of the following are true? Select all that apply.

Hint: Consider the factors and roots of the polynomial.

- A) It can be factored as  $(x(x - 2)^2)$ . ✓
- B) It has a double root at  $(x = 2)$ . ✓
- C) It has a root at  $(x = 0)$ . ✓
- D) It is a quadratic polynomial.

■ The true statements relate to the factorization and roots of the polynomial.

Explain how the graph of  $(y = (x - 2)^2)$  differs from the graph of  $(y = x^2)$ .

Hint: Consider the transformations applied to the basic quadratic function.

■ The graph of  $(y = (x - 2)^2)$  is shifted 2 units to the right compared to  $(y = x^2)$ .

Evaluate the expression  $(\frac{2x^2 - 8}{x - 2})$  for  $(x = 4)$ .

Hint: Substitute 4 into the expression and simplify.

- A) 0
- B) 4
- C) 8 ✓

D) 16

█ Evaluate the expression by substituting  $x$  and simplifying.

**Which of the following transformations will change the graph of  $(y = x^2)$  to  $(y = (x - 3)^2 + 2)$ ? Select all that apply.**

*Hint: Consider horizontal and vertical shifts.*

- A) Shift right by 3 units ✓
- B) Shift left by 3 units
- C) Shift up by 2 units ✓
- D) Shift down by 2 units

█ The transformations involve shifting the graph right and up.

**Create a real-world problem that can be solved using a system of linear equations. Provide the solution to your problem.**

*Hint: Think about two quantities that depend on each other.*

█ **The problem should involve two variables and a system of equations.**

**Design a quadratic equation that has roots at  $(x = 1)$  and  $(x = -3)$ . Write the equation in standard form.**

*Hint: Use the factored form to create the equation.*

1. Factored form

█  $(x - 1)(x + 3)$

2. Standard form

|  $x^2 + 2x - 3$

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| The equation can be written as  $y = (x - 1)(x + 3)$ .