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# Direct Variation Worksheet Questions and Answers PDF

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## Part 1: Building a Foundation

**What is the equation form of a direct variation?**

*Hint: Think about the basic equation that defines direct variation.*

◯ A) $y = mx + b$
◯ **B) $y = kx$** ✓
◯ C) $y = x^2 + k$
◯ D) $y = k/x$

> The correct equation form of direct variation is $y = kx$.

**Which of the following are characteristics of a direct variation?**

*Hint: Consider the properties that define direct variation.*

☐ **A) The graph is a straight line through the origin.** ✓
☐ **B) The ratio $y/x$ is constant.** ✓
☐ C) The graph is a parabola.
☐ **D) The equation can be written as $y = kx$.** ✓

> Characteristics of direct variation include a straight line through the origin and a constant ratio of y to x.

**Explain what the constant of variation k represents in the equation $y = kx$.**

*Hint: Think about how k affects the relationship between y and x.*

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> **The constant of variation k represents the rate at which y changes with respect to x.**

**List two real-world examples where direct variation might be observed.**

*Hint: Consider situations where one quantity directly affects another.*

1. Example 1

> Distance traveled over time at constant speed.

2. Example 2

> Cost of apples based on the number of apples bought.

> Examples include distance and time at constant speed, or cost and quantity of items.

## Part 2: Comprehension and Application

**If y varies directly with x and y = 10 when x = 2, what is the constant of variation k?**

*Hint: Use the formula y = kx to find k.*

○ **A) 5** ✔
○ B) 10
○ C) 2
○ D) 20

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To find k, divide y by x, which gives k = 5.

**Which of the following equations represent a direct variation?**

*Hint: Look for equations that can be expressed in the form y = kx.*

☐ A) y = 3x + 1
☐ **B) y = -4x ✓**
☐ **C) y = 1/2x ✓**
☐ D) y = x^2

The equations that represent direct variation are those that can be simplified to y = kx.

**Describe how you would determine if a set of data points represents a direct variation.**

*Hint: Consider the relationship between the x and y values.*

**To determine if data points represent direct variation, check if the ratio y/x is constant for all points.**

**A car travels at a constant speed. If the distance d varies directly with time t, and the car travels 150 miles in 3 hours, how far will it travel in 5 hours?**

*Hint: Use the direct variation relationship to find the answer.*

○ A) 200 miles
○ **B) 250 miles ✓**
○ C) 300 miles
○ D) 350 miles

The car will travel 250 miles in 5 hours.

**Given the direct variation equation y = 7x, which of the following points lie on the graph of this equation?**

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*Hint: Substitute the x values into the equation to find the corresponding y values.*

- ☐ **A) (1, 7) ✓**
- ☐ **B) (2, 14) ✓**
- ☐ C) (3, 20)
- ☐ **D) (4, 28) ✓**

The points (1, 7), (2, 14), and (4, 28) lie on the graph of the equation.

**A recipe calls for 4 cups of flour to make 8 servings. How many cups of flour are needed to make 20 servings, assuming direct variation?**

*Hint: Set up a proportion based on the servings and flour.*

**You would need 10 cups of flour to make 20 servings.**

## Part 3: Analysis, Evaluation, and Creation

**If the equation y = 5x represents a direct variation, what happens to y when x is doubled?**

*Hint: Consider how direct variation affects the relationship between x and y.*

- ○ A) y is halved
- ○ B) y remains the same
- ○ **C) y is doubled ✓**
- ○ D) y is quadrupled

When x is doubled, y is also doubled.

**Analyze the following scenarios and identify which ones involve direct variation:**

*Hint: Look for relationships where one variable directly affects another.*

- ☐ **A) The number of pages read and the time spent reading at a constant speed. ✓**

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☐ B) The height of a plant and the amount of sunlight it receives.

☐ **C) The cost of apples and the number of apples bought at a fixed price per apple. ✓**

☐ **D) The area of a square and the length of its side. ✓**

> Scenarios A, C, and D involve direct variation.

**Explain why the graph of a direct variation must pass through the origin.**

*Hint: Consider the definition of direct variation.*

> **The graph passes through the origin because when x = 0, y must also equal 0 in direct variation.**

**Which of the following statements is true about the constant of variation k in the equation y = kx?**

*Hint: Think about the properties of k in relation to the graph.*

◯ A) k can be zero.

◯ **B) k determines the slope of the line. ✓**

◯ C) k is always negative.

◯ D) k has no effect on the graph.

> The correct statement is that k determines the slope of the line.

**Evaluate the following equations and determine which ones could represent a direct variation with a positive constant of variation:**

*Hint: Look for equations that can be expressed in the form y = kx with k > 0.*

☐ **A) y = 0.5x ✓**

☐ B) y = -3x

☐ **C) y = 4x ✓**

☐ D) y = x - 2

> The equations A and C represent direct variation with a positive constant.

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**Create a real-world problem involving direct variation and solve it. Provide the context, the equation, and the solution.**

*Hint: Think of a situation where one quantity varies directly with another.*

> **An example could be calculating the cost of gas based on the number of gallons purchased.**

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