

# College Math Placement Practice Test Sample Study Guide



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**SAMPLE**

## **Questions**

1. What is the solution for  $y$  in the equation  $y/3 = 5$ ?
  - A. 10
  - B. 15
  - C. 20
  - D. 25
2. What is the least common multiple (LCM) of 4 and 6?
  - A. 12
  - B. 24
  - C. 30
  - D. 36
3. What is the slope of the line represented by the equation  $y = 4x + 7$ ?
  - A. 4
  - B. 7
  - C.  $1/4$
  - D. -4
4. What is the measure of an interior angle of a regular hexagon?
  - A. 90 degrees
  - B. 120 degrees
  - C. 135 degrees
  - D. 150 degrees
5. What is the financial formula for calculating simple interest?
  - A.  $I = PRT$
  - B.  $I = PRT^2$
  - C.  $I = P/R * T$
  - D.  $I = P + RT$

6. If a triangle has sides of lengths 3, 4, and 5, is it a right triangle?
- A. Yes
  - B. No
  - C. It depends
  - D. Only if the hypotenuse is the longest side
7. What is the area of a circle with a radius of 4?
- A.  $8\pi$
  - B.  $12\pi$
  - C.  $16\pi$
  - D.  $20\pi$
8. What is the length of a diagonal of a square playground with a perimeter of 120 yards?
- A.  $30\sqrt{2}$  yd
  - B. 45 yd
  - C.  $90\sqrt{2}$  yd
  - D.  $60\sqrt{2}$  yd
9. Which combination is equivalent to \$125.00?
- A. Nine \$10 bills and five \$5 bills
  - B. Five \$20 bills and three \$5 bills
  - C. Four \$20 bills and eight \$5 bills
  - D. Six \$20 bills and one \$5 bill
10. What is the value of  $\sin(90^\circ)$ ?
- A. 0
  - B. 0.5
  - C. 1
  - D.  $\sqrt{2}$

## **Answers**

SAMPLE

1. B
2. A
3. A
4. B
5. A
6. A
7. C
8. A
9. D
10. C

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## **Explanations**

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1. What is the solution for  $y$  in the equation  $y/3 = 5$ ?

A. 10

**B. 15**

C. 20

D. 25

To find the solution for  $y$  in the equation  $\frac{y}{3} = 5$ , you start by isolating  $y$ . This can be done by eliminating the fraction. You can achieve this by multiplying both sides of the equation by 3:  $3 \times \frac{y}{3} = 3 \times 5$ . On the left side, the 3s cancel each other out, leaving you with:  $y = 15$ . The right side simplifies to 15. Thus, the solution for  $y$  is indeed 15. This process showcases basic algebraic principles, specifically the idea of maintaining equality by performing the same operation on both sides of the equation. This understanding is fundamental for solving linear equations in algebra.

2. What is the least common multiple (LCM) of 4 and 6?

**A. 12**

B. 24

C. 30

D. 36

To find the least common multiple (LCM) of two numbers, we look for the smallest number that is a multiple of both. For the numbers 4 and 6, we start by identifying their prime factorizations: - The prime factorization of 4 is  $2^2$ . - The prime factorization of 6 is  $2^1 \times 3^1$ . To determine the LCM, we take each prime number that appears in the factorizations and use the highest power of that prime. - For the prime number 2, the highest power is  $2^2$  (from 4). - For the prime number 3, the highest power is  $3^1$  (from 6). Now, we multiply these together to find the LCM:  $LCM = 2^2 \times 3^1 = 4 \times 3 = 12$ . Thus, the least common multiple of 4 and 6 is 12, which confirms that the solution is indeed correct. The LCM serves as a foundational concept in number theory, particularly useful for adding or subtracting fractions with different denominators, or for solving

3. What is the slope of the line represented by the equation  $y = 4x + 7$ ?

**A. 4**

B. 7

C.  $1/4$

D. -4

The slope of a line in the equation of the form  $y = mx + b$  is determined by the coefficient of  $x$ , which is represented by  $m$ . In the equation provided,  $y = 4x + 7$ , the coefficient of  $x$  is 4. Therefore, the slope of the line is 4. This slope indicates that for every 1 unit increase in  $x$ , the value of  $y$  increases by 4 units. Understanding the slope is crucial because it describes the steepness and direction of the line. A positive slope, like 4, means the line rises as you move from left to right. The other values presented do not correspond to the slope based on the equation format. The number 7 represents the y-intercept, indicating where the line crosses the y-axis, but is not related to the slope itself. The fractions and negative numbers would represent different inclinations not applicable to this equation. Thus, the correct answer aligns with the definition of slope in the context of a linear equation.

4. What is the measure of an interior angle of a regular hexagon?

- A. 90 degrees
- B. 120 degrees**
- C. 135 degrees
- D. 150 degrees

To determine the measure of an interior angle of a regular hexagon, one can use the formula for calculating the measure of an interior angle of a regular polygon. The formula is:  $\text{Interior Angle} = \frac{(n - 2) \times 180}{n}$  where  $(n)$  is the number of sides of the polygon. For a hexagon,  $(n = 6)$ . Substituting in the values for a hexagon:  $\text{Interior Angle} = \frac{(6 - 2) \times 180}{6} = \frac{4 \times 180}{6} = \frac{720}{6} = 120 \text{ degrees}$  Thus, the measure of an interior angle of a regular hexagon is 120 degrees. This result derives from the understanding that a hexagon consists of six equal angles, all measuring the same due to the regularity of the shape. Each interior angle contributes to the total of interior angles in the polygon, reinforcing the calculation.

5. What is the financial formula for calculating simple interest?

- A.  $I = PRT$**
- B.  $I = PRT^2$
- C.  $I = P/R * T$
- D.  $I = P + RT$

The correct formula for calculating simple interest is represented by  $I = PRT$ . In this formula: -  $I$  stands for the interest earned or paid. -  $P$  represents the principal amount, which is the initial sum of money invested or borrowed. -  $R$  denotes the rate of interest, expressed as a decimal (for example, 5% would be 0.05). -  $T$  is the time the money is invested or borrowed for, typically measured in years. This formula indicates that the interest is directly proportional to the principal, the rate of interest, and the time period. By multiplying these three components, you can determine the total interest accrued over the specified period. The other options do not correctly represent the formula for simple interest. For instance, including  $T^2$  suggests a compounding effect which does not apply to simple interest calculations. Similarly, the formula involving division by  $P$  or the addition of  $RT$  does not accurately describe how simple interest is calculated. Understanding these distinctions is essential for effectively applying financial concepts.

6. If a triangle has sides of lengths 3, 4, and 5, is it a right triangle?

**A. Yes**

B. No

C. It depends

D. Only if the hypotenuse is the longest side

To determine if a triangle with side lengths 3, 4, and 5 is a right triangle, we can apply the Pythagorean theorem, which states that in a right triangle, the square of the length of the hypotenuse (the longest side) is equal to the sum of the squares of the lengths of the other two sides. In this case, we identify the longest side, which is 5. We then calculate the squares of the side lengths: - The square of the hypotenuse:  $(5^2 = 25)$  - The square of the first side:  $(3^2 = 9)$  - The square of the second side:  $(4^2 = 16)$  Next, we add the squares of the two shorter sides:  $[ 3^2 + 4^2 = 9 + 16 = 25 ]$  Now we can compare the results from the Pythagorean theorem:  $[ 5^2 = 3^2 + 4^2 ] [ 25 = 25 ]$  Since the equality holds true, it confirms that the triangle with sides 3, 4, and 5 satisfies the Pythagorean

7. What is the area of a circle with a radius of 4?

A.  $8\pi$

B.  $12\pi$

**C.  $16\pi$**

D.  $20\pi$

To determine the area of a circle, the formula used is  $( A = \pi r^2 )$ , where  $( A )$  represents the area and  $( r )$  is the radius of the circle. In this case, the radius given is 4. Plugging this value into the formula, we calculate the area as follows: 1. Square the radius:  $( 4^2 = 16 )$ . 2. Multiply by  $( \pi )$ :  $( A = \pi \times 16 = 16\pi )$ . Thus, the area of the circle is  $( 16\pi )$ . This correctly identifies option C as the answer. Other options suggest computations that either arise from incorrect squarings of the radius or misunderstandings of how to apply the area formula for a circle.

8. What is the length of a diagonal of a square playground with a perimeter of 120 yards?

**A.  $30\sqrt{2}$  yd**

B. 45 yd

C.  $90\sqrt{2}$  yd

D.  $60\sqrt{2}$  yd

To determine the length of the diagonal of a square playground given its perimeter, we start with the formula for the perimeter of a square, which is  $( P = 4s )$ , where  $( s )$  is the length of one side of the square. Given that the perimeter is 120 yards, we can solve for  $( s )$ :  $[ 4s = 120 ]$  Dividing both sides by 4 gives us:  $[ s = 30 \text{ yards} ]$  Next, we need to find the length of the diagonal. The diagonal  $( d )$  of a square can be calculated using the Pythagorean theorem, since the diagonal forms a right triangle with two sides of the square. The formula for the diagonal in terms of the side length is:  $[ d = s\sqrt{2} ]$  Substituting  $( s )$  with 30 yards, we find:  $[ d = 30\sqrt{2} \text{ yards} ]$  Therefore, the length of the diagonal of the square playground is  $( 30\sqrt{2} )$  yards, making the correct choice consistent with this calculation. The presence of  $( \sqrt{2} )$

**9. Which combination is equivalent to \$125.00?**

- A. Nine \$10 bills and five \$5 bills**
- B. Five \$20 bills and three \$5 bills**
- C. Four \$20 bills and eight \$5 bills**
- D. Six \$20 bills and one \$5 bill**

To determine which combination of bills equals \$125.00, we need to calculate the total value of each option. For the option that you thought was correct, which is six \$20 bills and one \$5 bill, we calculate the total as follows: - Six \$20 bills amount to  $(6 \times 20 = 120)$ . - One \$5 bill adds an additional  $(5)$ . Adding these together:  $[ 120 + 5 = 125 ]$  This confirms that six \$20 bills and one \$5 bill sums to \$125.00. When solving similar questions, it can be helpful to break down the values of each combination of bills to see if they fulfill the required total. Understanding how to manipulate and combine different denominations accurately ensures you arrive at the correct total.

**10. What is the value of  $\sin(90^\circ)$ ?**

- A. 0**
- B. 0.5**
- C. 1**
- D.  $\sqrt{2}$**

The value of  $\sin(90^\circ)$  is 1 because, in the context of the unit circle, the sine function corresponds to the y-coordinate of a point on the circle. At an angle of 90 degrees, the point on the unit circle is located at the coordinates (0, 1). This means that the y-coordinate, which represents the value of the sine function, is 1. In trigonometric terms, this can also be understood via the definition of the sine function as the ratio of the length of the opposite side to the hypotenuse in a right triangle. At an angle of 90 degrees, the entire length of the hypotenuse is represented by the opposite side, making the ratio equal to 1. Thus, the correct value for  $\sin(90^\circ)$  is indeed 1.