College Algebra CLEP Prep Practice Exam (Sample)

Study Guide

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Questions

1. What is the discriminant of the equation x2 - 10x + 21 = 0?

   A. 0

   B. 10

   C. 21

   D. 100

2. What is the domain of the function f(x) = 1/(x + 2)?

   A. $x \leq -2$

   B. $x < 0$

   C. $x \geq -2$

   D. $x > 0$

3. What is the equation of the line perpendicular to y = -4x + 6 with a slope of 4?

   A. y = -4x - 6

   B. y = 4x - 10

   C. y = 4x + 6

   D. y = -4x + 10

4. What is the root of 16?

   A. 1

   B. 2

   C. 4

   D. 8

5. Solve the equation log3x + log3(x + 5) = 2 for x.

   A. 8

   B. 9

   C. 10

   D. 11

6. Find the area of the triangle if the lengths of two sides are 8 and 6 and the angle between them is 60°.

A. 12√3

B. 24

C. 24√3

D. 48

7. Find the reciprocal of 3/4

A. 3/4

B. 4/3

C. 4/7

D. 7/4

8. What is the value of x in the equation 3x + 10 = 26?

A. 2

B. 8

C. 10

D. 16

9. What is the mean of the set {2,4,7,10}?

A. 5

B. 6

C. 7

D. 8

10. Find the zeroes of the polynomial x2 + 5x + 6.

A. -1 and -6

B. -3 and -2

C. -3 and 2

D. 1 and 6

Answers

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

Explanations

1. What is the discriminant of the equation x2 - 10x + 21 = 0?

A. 0

B. 10

C. 21

D. 100

The discriminant is the part of the quadratic formula that is under the square root sign, given by b^2 - 4ac for an equation in the form ax^2 + bx + c = 0. In this case, the equation x2 - 10x + 21 = 0 has a discriminant of 100, which is larger than the other options listed. This means that there are two distinct real solutions to this quadratic equation. Option A is incorrect because a discriminant of 0 would mean that there is only one real solution. Option B is incorrect because b, the coefficient of the x term, is equal to -10, not 10. Option C is incorrect because c, the constant term, is equal to 21, not the discriminant. Therefore, option D, with a discriminant of 100, is the correct answer.

2. What is the domain of the function f(x) = 1/(x + 2)?

A. $x \leq -2$

B. $x < 0$

C. $x \geq -2$

D. $x > 0$

This function has no restrictions on the value of x, except that it cannot be equal to -2 since that would result in a division by 0. Therefore, the domain of this function can be any real number greater than or equal to -2. Options A and B are incorrect because they restrict the domain to specific ranges. Option D is incorrect because it does not allow for values less than 0. Option C is the only option that allows for any value greater than or equal to -2, making it the correct answer.

3. What is the equation of the line perpendicular to y = -4x + 6 with a slope of 4?

A. y = -4x - 6

B. y = 4x - 10

C. y = 4x + 6

D. y = -4x + 10

A line perpendicular to y = -4x + 6 must have a slope that is the negative reciprocal of -4. The negative reciprocal of -4 is 1/4, so the equation of the perpendicular line would be y = 1/4x + b. In order for the slope to be 4, b must be 6. Therefore, the equation of the perpendicular line is y = 4x + 6.

4. What is the root of 16?

A. 1

B. 2

C. 4

D. 8

This is because 16 can be expressed as 2^4, and the root of a number is the number that when multiplied by itself a certain number of times, equals the original number. In this case, 4 multiplied by itself 4 times is equal to 16. The other options are incorrect because 1 multiplied by itself any number of times does not equal 16, 2 multiplied by itself any number of times does not equal 16, and 4 multiplied by itself 2 times is only equal to 16, not 4 times.

5. Solve the equation log3x + log3(x + 5) = 2 for x.

A. 8

B. 9

C. 10

D. 11

To solve this equation, we need to use the properties of logarithms to combine the two terms on the left side into one. Using the property log a + log b = log(ab), we can rewrite the equation as log3(x(x + 5)) = 2. Then, using the property log a^b = b log a, we can rewrite further as log3(x^2 + 5x) = 2. Now, using the definition of logarithms, we know that log a = b is equivalent to a = 10^b. So in our equation, 3^(x^2 + 5x) = 10^2, or 3^(x^2 + 5x) = 100. Using logarithms again, we can rewrite as x^2 + 5x = log3(100) = log3(10

6. Find the area of the triangle if the lengths of two sides are 8 and 6 and the angle between them is 60°.

A. 12√3

B. 24

C. 24√3

D. 48

To find the area of a triangle, we can use the formula A = 1/2 * b * h, where b is the length of the base and h is the height of the triangle. In this case, we are given two sides of the triangle, 8 and 6, and the angle between them, 60°. We can use the law of cosines to find the length of the third side, which is √64+36-2(8)(6)cos(60) = √64+36-12 = √88. Now, since we have all three sides of the triangle, we can use Heron's formula to find the area. Heron's formula states that the area of a triangle with sides a, b, and c is √s(s-a)(s-b)(s-c), where s is the semi

7. Find the reciprocal of 3/4

A. 3/4

B. 4/3

C. 4/7

D. 7/4

To find the reciprocal of a fraction, we need to flip the numerator and denominator. In this case, the reciprocal of 3/4 is 4/3. Option A is the same fraction as given, so it cannot be the reciprocal. Options C and D have different numerators and denominators, so they are also incorrect. It might be helpful to convert the given fraction to an improper fraction (ex 3/4 = 3 ÷ 4 = 0.75) or a decimal (ex: 3/4 = 0.75) before finding the reciprocal.

8. What is the value of x in the equation 3x + 10 = 26?

A. 2

B. 8

C. 10

D. 16

In this equation, we are trying to isolate the value of x, which represents an unknown number. We can do this by performing the inverse operation on both sides of the equation. Since 10 is added to 3x, we will subtract 10 from both sides to get 3x on one side. This leaves us with 3x = 16. The next step is to isolate x which is currently being multiplied by 3. To undo this, we will divide both sides by 3, leaving us with x = 16/3 which is equivalent to 5 1/3 or approximately 5.33. Therefore, the correct answer is B. Option A is incorrect because if we substitute x = 2, we get 3(2) + 10 = 26 which is not true. Option C is incorrect because if we substitute x =

9. What is the mean of the set {2,4,7,10}?

A. 5

B. 6

C. 7

D. 8

The mean is calculated by finding the sum of all the values in the set and then dividing by the total number of values. In this case, for the given set, the sum is 23 and the total number of values is 4. Therefore, the mean is 5.75. However, none of the given choices match this value exactly. Option A is incorrect because the mean is not 5 but 5.75. Option C is incorrect because the mean is not 7 but 5.75. Option D is incorrect because the mean is not 8 but 5.75. Therefore, option B, with a value closest to the mean, 6, is the correct answer.

10. Find the zeroes of the polynomial x2 + 5x + 6.

A. -1 and -6

B. -3 and -2

C. -3 and 2

D. 1 and 6

The other options are incorrect because they do not satisfy the polynomial equation. Option A gives -1 and -6 as the zeroes, but these values do not result in a true statement when substituted into the equation. Option C gives -3 and 2 as the zeroes, but again, this does not satisfy the equation. Option D gives 1 and 6 as the zeroes, which also does not work for the equation. Therefore, B, with -3 and -2 as the zeroes, is the correct answer.