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Graded quiz on Cartesian Plane and Types of Function

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1. Which of the following points in the Cartesian Plane have positive x-coordinate and negative y-coordinate? `1 / 1 point`

- ⦿ $(7, -1)$
- ○ $(0, 0)$
- ○ $(-4, 5)$
- ○ $(5, 7)$

✓ **Correct**
The x-coordinate, 7, is positive, and the y-coordinate, -1, is negative.

2. Which of the following points is in the first quadrant of the Cartesian Plane? `1 / 1 point`

- ○ $(-5, 1)$
- ⦿ $(7, 11)$
- ○ $(5, -1)$
- ○ $(-4, -7)$

✓ **Correct**
The first quadrant is defined to be all points in the Cartesian plane whose coordinates are both positive.

3. Let A, B, C, D be points in the Cartesian Plane, and let the set $S = \{B, C, D\}$ `1 / 1 point`

Suppose that the distances from A to B, C, D are $5.3, 2.1$, and 11.75, respectively.

Which of the following points is the nearest neighbor to the point A in the set S?

- ○ D
- ○ B
- ○ A
- ⦿ C

✓ **Correct**
The distance from A to C is 2.1 and that is smaller than the distance from A to any other element of S.

4. Find the distance between the points $A = (2, 2)$ and $B = (-1, -2)$. `1 / 1 point`

- ⦿ 5
- ○ -25
- ○ 25
- ○ 1

✓ **Correct**

Recall that the distance between points (a, b) and (c, d) is $\sqrt{(c-a)^2 + (d-b)^2}$

In this case we have:

$$\sqrt{(-1-2)^2 + (-2-2)^2} = \sqrt{(-3)^2 + (-4)^2} = \sqrt{25} = 5$$

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5. Find the slope of the line segment between the points $A = (0, 1)$ and $B = (1, 0)$.

1 / 1 point

- ⦿ -1
- ○ 1
- ○ $\sqrt{2}$
- ○ 0

✓ **Correct**

The slope of this line segment is $\dfrac{0-1}{1-0} = -1$

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6. Find the point-slope form of the equation of the line with slope -2 that goes through the point $(5, 4)$.

1 / 1 point

- ⦿ $y - 4 = -2(x - 5)$
- ○ $(5, 4)$
- ○ $y - 4 = 2(x - 5)$
- ○ $y - 5 = -2(x - 4)$

✓ **Correct**

The point-slope form for the equation of a line with slope m that goes through the point (x_0, y_0) is $y - y_0 = m(x - x_0)$.

In this case, the slope $m = -2$ is given and the point $(5, 4)$ on the line is given.

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7. Which of the following equations is for a line with the same slope as $y = -3x + 2$?

1 / 1 point

- ○ $y = 5x + 2$
- ⦿ $y = -3x - 8$
- ○ $y = 5x$
- ○ $y = 8x - 3$

✓ **Correct**

The slope-intercept formula for a line is $y = mx + b$, where m is the slope and b is the y-coordinate of the point where the line hits the y-axis.

This line has slope $m = -3$ which is the same slope as the given line.

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8. Which of the following equations is for a line with the same y-intercept as $y = -3x + 2$?

1 / 1 point

- ○ $y = 8x - 3$
- ○ $y = -3x - 8$
- ○ $y = 5x$
- ⦿ $y = 5x + 2$

9. How many lines contain both the point $A = (1, 1)$ and the point $B = (2, 2)$?   `1 / 1 point`

○ 1

○ infinitely many

○ None

○ 2

10. Suppose that we have two sets, $A = \{a, b\}$ and $Z = \{x, y\}$. How many different functions $F : A \to Z$ are possible?   `1 / 1 point`

○ 4

○ 1

○ There are infinitely many

○ There are none

11. How many graphs contain both the point $A = (0, 0)$ and the point $B = (1, 1)$ `1 / 1 point`

○ 2

○ 1

○ Infinitely many

○ None

12. Suppose that $g : \mathbb{R} \to \mathbb{R}$ is a continuous function whose graph intersects the x-axis more than once. Which of the following statements is true?   `1 / 1 point`

○ g is strictly decreasing.

○ g is strictly increasing.

○ All of the above.

◉ g is neither strictly increasing nor strictly decreasing.

> ✓ **Correct**
>
> The function g fails the horizontal line test, so it can neither be strictly increasing nor strictly decreasing.

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13. Find the slope of the line segment between the points $A = (1, 1)$ and $B = (5, 3)$.

1 / 1 point

○ 2

○ $\sqrt{20}$

◉ $\dfrac{1}{2}$

○ 4

> ✓ **Correct**
>
> The slope of this line segment is $\dfrac{3-1}{5-1} = \dfrac{1}{2}$, where $3-1$ is the rise and $5-1$ is the run.