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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**

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

✓ **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**

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

✓ **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
- (●) C
- B
- A

✓ **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**

- -25
- (●) 5
- 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:

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

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

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 $\dfrac{0-1}{1-0} = -1$

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.

7. Which of the following equations is for a line with the same slope as $y = -3x + 2$? 1 / 1 point

- $y = 8x - 3$
- $y = 5x + 2$
- **(selected)** $y = -3x - 8$
- $y = 5x$

✓ **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.

8. Which of the following equations is for a line with the same y-intercept as $y = -3x + 2$? 1 / 1 point

- **(selected)** $y = 5x + 2$
- $y = -3x - 8$
- $y = 8x - 3$
- $y = 5x$

✓ **Correct**

The 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 a y-intercept of 2 which is the same as the given line.

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

- infinitely many
- **(selected)** 1
- None
- 2

✓ **Correct**

The line with equation $y = x$ is the one and only line that meets the stated requirements.

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
- ( ) There are none
- ( ) 1
- ( ) There are infinitely many

✓ **Correct**

A function $F : A \to Z$ is a rule which assigns an element $F(a) \in Z$ to each element $a \in A$.

There are two elements in A; namely, a and b. For each of these elements, there are two assignment choices we could make: x and y.

Here are the four possible functions:

$F(a) = x, F(b) = y$, OR

$F(a) = y, F(b) = x$, OR

$F(a) = x, F(b) = x$, OR

$F(a) = y, F(b) = y$.

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

- ○ None
- ◉ Infinitely many
- ○ 1
- ○ 2

✓ **Correct**
The graphs of $f(x) = x, g(x) = x^2, h(x) = x^3, s(x) = x^4, \ldots$ all contain both A and B

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 increasing.
- ◉ g is neither strictly increasing nor strictly decreasing.
- ○ g is strictly decreasing.
- ○ All of the above.

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

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

- ◉ $\frac{1}{2}$
- ○ 2
- ○ 4
- ○ $\sqrt{20}$

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