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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`

   ○ $(0, 0)$

   ◉ $(7, -1)$

   ○ $(-4, 5)$

   ○ $(5, 7)$

   > ✓ **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`

   ◉ $(7, 11)$

   ○ $(-5, 1)$

   ○ $(-4, -7)$

   ○ $(5, -1)$

   > ✓ **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?

   ○ B

   ◉ C

   ○ D

   ○ 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

   ○ 1

   ◉ 5

○ 25

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

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

0 / 1 point

○ $(5, 4)$

⦿ $y - 4 = 2(x - 5)$

○ $y - 5 = -2(x - 4)$

○ $y - 4 = -2(x - 5)$

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

1 / 1 point

⦿ $y = -3x - 8$

○ $y = 8x - 3$

○ $y = 5x$

○ $y = 5x + 2$

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

0 / 1 point

⦿ $y = -3x - 8$

○ $y = 8x - 3$

○ $y = 5x + 2$

○ $y = 5x$

✗ Incorrect

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 does share a slope ($m = -3$) with the given line, but does not have the same y-intercept.

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

`1 / 1 point`

○ infinitely many

◉ 1

○ 2

○ None

✓ Correct

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

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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`

○ There are none

○ 1

○ There are infinitely many

◉ 4

✓ 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

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

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

`1 / 1 point`

◉ Infinitely many

○ None

○ 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

○ All of the above.

○ g is strictly decreasing.

○ g is strictly increasing.

⦿ 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

○ 4

⦿ $\dfrac{1}{2}$

○ 2

○ $\sqrt{20}$

✓ **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.