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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)
- ☐ (-4, 5)
- ☒ (7, -1)
- ☐ (0, 0)

✓ **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)
- ☐ (-5, 1)
- ☒ (7, 11)
- ☐ (-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
- ☐ A
- ☒ C
- ☐ B

✓ **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
- ☐ -25
- ☒ 5
- ☐ 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

- ☒ -1
- ☐ 1
- ☐ $\sqrt{2}$
- ☐ 0

✓ **Correct**

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

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

- ☐ $y = 5x$
- ☒ $y = -3x - 8$
- ☐ $y = 5x + 2$
- ☐ $y = 8x - 3$

✓ 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.

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

1 / 1 point

- ☐ $y = 5x$
- ☐ $y = -3x - 8$
- ☐ $y = 8x - 3$
- ☒ $y = 5x + 2$

✓ 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 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
- ☐ 2
- ☒ 1
- ☐ None

✓ 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 $F : A \rightarrow Z$ are possible?

1 / 1 point

- ☐ There are infinitely many
- ☐ There are none
- ☒ 4
- ☐ 1

✓ Correct

A function $F : A \rightarrow Z$ 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:

$$F(a) = x, F(b) = y, \text{ OR}$$

$$F(a) = y, F(b) = x, \text{ OR}$$

$$F(a) = x, F(b) = x, \text{ OR}$$

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

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

1 / 1 point

- ☒ Infinitely many
- ☐ 1
- ☐ None
- ☐ 2

✓ Correct

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

12. Suppose that $g : \mathbb{R} \rightarrow \mathbb{R}$ 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.
- ☐ All of the above.
- ☒ g is neither strictly increasing nor strictly decreasing.
- ☐ g is strictly decreasing.

✓ 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.