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Practice quiz on the Cartesian Plane

PUNTOS TOTALES DE 5

1. Which of the following points in the Cartesian Plane is on the y -axis?

1 / 1 punto

- ☐ $(1, 1)$
- ☐ $(-5, 0)$
- ☒ $(0, -5)$
- ☐ $(5, 0)$

✓ Correcto

The y -axis is defined to be all points in the Cartesian plane with zero as x -coordinate. The point

2. Find the distance between the points $A = (2, 2)$ and $C = (3, 3)$:

1 / 1 punto

- ☐ 2
- ☒ $\sqrt{2}$
- ☐ 0
- ☐ 1

✓ Correcto

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

In this case $(a, b) = (2, 2)$ and $(c, d) = (3, 3)$, so the distance is $\sqrt{(3 - 2)^2 + (3 - 2)^2} = \sqrt{2}$.

3. Find the point-slope form of the equation of the line that goes between $A = (1, 1)$ and $B = (5, 3)$:

1 / 1 punto

- ☐ $y = \frac{1}{2}x$
- ☒ $y - 1 = \frac{1}{2}(x - 1)$
- ☐ $y - 3 = \frac{1}{2}(x - 1)$



3. Find the point-slope form of the equation of the line that goes between $A = (1, 1)$ and $B = (5, 3)$:

1 / 1 punto

- ☐ $y = \frac{1}{2}x$
- ☒ $y - 1 = \frac{1}{2}(x - 1)$
- ☐ $y - 3 = \frac{1}{2}(x - 1)$
- ☐ $y - 1 = \frac{1}{2}(x - 5)$

✓ **Correcto**

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 $m = \frac{3 - 1}{5 - 1} = \frac{1}{2}$

We can choose either A or B for the point on the line, but in neither case do we get this chosen answer.

4. Which of the following points is on the line with equation:

1 / 1 punto

$$y - 1 = 2(x - 2)?$$

- ☐ $(0, 0)$
- ☐ $(2, 3)$
- ☐ $(3, 2)$
- ☒ $(2, 1)$

✓ **Correcto**

If we plug in 1 for y and 2 for x in the equation of the line, we make a true statement, $0 = 0$, so this point lies on the line.

5. Suppose that a line ℓ has slope 2 and goes through the point $(-1, 0)$. What is the y -intercept of ℓ ?

1 / 1 punto

- ☐ 0
- ☐ 1
- ☐ -1



✓ **Correcto**

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5. Suppose that a line ℓ has slope 2 and goes through the point $(-1, 0)$. What is the y -intercept of ℓ ?

1 / 1 punto

- ☐ 0
- ☐ 1
- ☐ -1
- ☒ 2

✓ **Correcto**

Recall that the y -intercept of ℓ is the y -coordinate of where ℓ hits the y -axis.

Since $(-1, 0) \in \ell$, the point on ℓ with $x = 0$ is obtained by running one unit from $(-1, 0)$ while rising two units.

This gives $y = 2$ as the y -intercept.

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Practice quiz on Types of Functions

PUNTOS TOTALES DE 6


1. Suppose that $A = \{1, 2, 10\}$ and $B = \{4, 8, 40\}$. Which of the following formulae do *not* define a function $f : A \rightarrow B$? 1 / 1 punto
- ☒

$f(1) = 5, f(2) = 8,$ and $f(10) = 40.$
- ☐

$f(a) = 4a,$ for each $a \in A$
- ☐

$f(1) = 4, f(2) = 40,$ and $f(10) = 8.$
- ☐

$f(1) = 4, f(2) = 4,$ and $f(10) = 4.$

 **Correcto**

A function $f : A \rightarrow B$ is a rule which assigns an element $f(a) \in B$ to each $a \in A$. In this case, unfortunately, $f(1) = 5 \notin B$.

2. Suppose that A contains every person in the VBS study (see the second video in the course if you're confused here!). Suppose that $Y = \{+, -\}$ and $Z = \{H, S\}$ 1 / 1 punto

Suppose that $T : A \rightarrow Y$ is the function which gives $T(a) = +$ if person a tests positive and $T(a) = -$ if they test negative.

Suppose that $D : A \rightarrow Z$ is the function which gives $D(a) = H$ does not actually have VBS and $D(a) = S$ if the person actually has VBS.

Which of the following must be true of person a if we have a false positive?


- ☐

$T(a) = -$ and $D(a) = H$
- ☐

$T(a) = -$ and $D(a) = S$
- ☒

$T(a) = +$ and $D(a) = H$
- ☐

$T(a) = +$ and $D(a) = S$

 **Correcto**

Recall that a false positive is a positive test result (so $T(a) = +$) which is misleading because the person actually does not have the disease ($D(a) = H$)



Prueba de práctica sobre tipos de funciones

Cuestionario Práctico • 20 min

3. Consider the function $g : \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = x^2 - 1$. Which of the following points are *not* on the graph of g ?

1 / 1 punto

- ☐ $(-1, 0)$
- ☒ $(2, -1)$
- ☐ $(0, -1)$
- ☐ $(1, 0)$



Correcto

Recall that the graph of g consists of all points (x, y) such that $y = g(x)$. Here $g(2) = 3 \neq -1$, so the point $(2, -1)$ is *not* on the graph of g .

4. Let the point $A = (2, 4)$. Which of the following graphs does *not* contain the point A ?

1 / 1 punto

- ☐ The graph of $f(x) = 2x$
- ☐ The graph of $s(x) = x^2$
- ☐ The graph of $g(x) = x + 2$
- ☒ The graph of $h(x) = x - 1$



Prueba de práctica sobre tipos de funciones

Cuestionario Práctico • 20 min

5. Suppose that $h(x) = -3x + 4$. Which of the following statements is true?

1 / 1 punto

- ☐ h is neither a strictly increasing function nor a strictly decreasing function.
- ☒ h is a strictly decreasing function
- ☐ All statements are correct
- ☐ h is a strictly increasing function



Correcto

A function h is called strictly decreasing if whenever $a < b$, then $h(a) > h(b)$

Since the graph of h is a line with negative slope, this is in fact true!

6. Suppose that $f : \mathbb{R} \rightarrow \mathbb{R}$ is a strictly increasing function, with $f(3) = 15$

1 / 1 punto

Which of the following is a possible value for $f(3.7)$?

- ☐ 3
- ☐ 14.7
- ☒ 17



Correcto

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Since the graph of h is a line with negative slope, this is in fact true!

6. Suppose that $f : \mathbb{R} \rightarrow \mathbb{R}$ is a strictly increasing function, with $f(3) = 15$

1 / 1 punto

Which of the following is a possible value for $f(3.7)$?

- ☐ 3
- ☐ 14.7
- ☒ 17
- ☐ -3



Correcto

A function f is called strictly increasing if whenever $a < b$, then $f(a) < f(b)$.

Since $f(3) = 15$ is given and $3 < 3.7$, it must be that $15 < f(3.7)$, and this answer satisfies that.



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Graded quiz on Cartesian Plane and Types of Function

CALIFICACIÓN DEL ÚLTIMO ENVÍO

100%

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

1 / 1 punto

- ☐ (0, 0)
- ☒ (7, -1)
- ☐ (-4, 5)
- ☐ (5, 7)



Correcto

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 punto

- ☒ (7, 11)
- ☐ (−4, −7)
- ☐ (5, −1)
- ☐ (−5, 1)

✓ Correcto

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 punto

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 ?

- ☐ A
- ☐ D

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

1 / 1 punto

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 ?

- ☐ A
- ☐ D
- ☒ C
- ☐ B

✓ Correcto

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 punto

- ☐ −25
- ☒ 5



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

1 / 1 punto

- ☐ -25
- ☒ 5
- ☐ 25
- ☐ 1

✓ **Correcto**

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 punto

- ☒ -1
- ☐ 1



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

1 / 1 punto

- ☒ -1
- ☐ 1
- ☐ $\sqrt{2}$
- ☐ 0

✓ **Correcto**

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 punto

- ☐ $y - 5 = -2(x - 4)$
- ☒ $y - 4 = -2(x - 5)$
- ☐ $(5, 4)$
- ☐ $y - 4 = 2(x - 5)$



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

1 / 1 punto

- ☐ $y - 5 = -2(x - 4)$
- ☒ $y - 4 = -2(x - 5)$
- ☐ $(5, 4)$
- ☐ $y - 4 = 2(x - 5)$

✓ **Correcto**

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 punto

- ☐ $y = 5x$
- ☒ $y = -3x - 8$



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

1 / 1 punto

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

✓ **Correcto**

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 punto

- ☐ $y = -3x - 8$
- ☐ $y = 5x$



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

1 / 1 punto

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

✓ **Correcto**

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 punto

- ☐ None
- ☒ 1
- ☐ 2
- ☐ infinitely many



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

1 / 1 punto

- ☐ None
- ☒ 1
- ☐ 2
- ☐ infinitely many

✓ **Correcto**

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 punto

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



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 punto

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



Correcto

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:

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

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



Correcto

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 punto

- ☐ g is strictly increasing.
- ☐ All of the above.
- ☒ g is neither strictly increasing nor strictly decreasing.
- ☐ g is strictly decreasing.



☒ g is neither strictly increasing nor strictly decreasing.

☐ g is strictly decreasing.

✓ **Correcto**

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 punto

☒ $\frac{1}{2}$

☐ 2

☐ 4

☐ $\sqrt{20}$

✓ **Correcto**

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.