✓ **Congratulations! You passed!**

TO PASS 75% or higher

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Practice quiz on the Cartesian Plane

TOTAL POINTS 5

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

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

✓ **Correct**

The y-axis is defined to be all points in the Cartesian plane with zero as x-coordinate. The point $(0, -5)$ meets that requirement.

2. Find the distance between the points $A = (2, 2)$ and $C = (3, 3)$: 1 / 1 point

- ○ 0
- ○ 2
- ◉ $\sqrt{2}$
- ○ 1

✓ **Correct**

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 point

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

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

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 point

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

- $(3, 2)$
- $(0, 0)$
- $(2, 3)$
- (selected) $(2, 1)$

✓ **Correct**

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 point**

- ○ 0
- ○ 1
- ◉ 2
- ○ -1

✓ **Correct**

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.

7. Which of the following real numbers is not in the closed interval $[2, 3]$ 1 / 1 point

- (●) 1
- ( ) 2.1
- ( ) 2
- ( ) 3

✓ **Correct**
Recall that the closed interval $[2, 3]$ consists of all
real numbers x which satisfy $2 \leq x \leq 3$. Since $2 \leq 1$ is false, $1 \notin [2, 3]$

8. Which of the following intervals represents the set of all solutions to: 1 / 1 point

$-5 \leq x + 2 < 10$?

- ( ) $(7, 8)$
- ( ) $[-5, 10)$
- (●) $[-7, 8)$
- ( ) $[-7, 8]$

✓ **Correct**
Subtracting 2 from all sides of the inequalities gives $-7 \leq x < 8$, and the set of all real numbers x which make that true is exactly
the half-open interval $[-7, 8)$.

9. Which of the numbers below is equal to the following summation: $\Sigma_{k=2}^{5} 2k$? 0 / 1 point

- ○ 4
- ○ 28
- ○ 10
- ◉ 14

✗ **Incorrect**

If you got here, you probably forgot to multiply each term by two before you added up all the terms.

10. Suppose we already know that $\Sigma_{k=1}^{20} k = 210$. Which of the numbers below is equal to $\Sigma_{k=1}^{20} 2k$? 1 / 1 point

- ○ 40
- ◉ 420
- ○ 2
- ○ 210

✓ **Correct**

By applying one of our Sigma notation simplification rules, we can rewrite the summation in question as $2\left(\Sigma_{k=1}^{20} k\right) = 2 \times 210 = 420$.

11. Which of the numbers below is equal to the summation $\Sigma_{i=2}^{10} 7$? 1 / 1 point

- ○ 70
- ◉ 63
- ○ 48
- ○ 7

✓ **Correct**
According to one of our Sigma notation simplification rules, this summation is just equal to 9 copies of the number 7 all added together, and so we get $9 \cdot 7 = 63$.

12. Which of the following numbers is the variance of the set $Z = \{-2, 4, 7\}$? 1 / 1 point

- ○ $\sqrt{14}$
- ◉ 14
- ○ 69
- ○ 42

✓ **Correct**
To get the variance of a set of numbers, you need to perform four steps:

First compute the mean (which is 3)

Then calculate all the squared differences between the numbers in the set and this mean (here you get $25, 1, 16$)

Then add all these up (here you get 42)

Then divide by the number of elements in the set (which is 3).

Therefore, the variance of Z

$$= \frac{1}{3}\left[(-2-3)^2 + (4-3)^2 + (7-3)^2\right]$$

$$= \frac{1}{3}\left[25 + 1 + 16\right] = \frac{42}{3} = 14$$

13. Which of the following sets does *not* have zero variance? (hint: don't do any calculation here, just think!) 1 / 1 point

- ○ $\{1, 1, 1, 1\}$
- ◉ $\{2, 5, 9, 13\}$
- ○ $\{0, 0, 0, 0, 0, 0, 0\}$
- ○ $\{5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5\}$

✓ **Correct**
Intuitively, the numbers in this set are spread out.