

## Graded quiz on Cartesian Plane and Types of Function

Оценка последней работы: 100%

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

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

Правильно

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 балл

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

Правильно

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 балл

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
- ☐ D
- ☐ A
- ☒ C

Правильно

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 балл

- ☒ 5
- ☐ −25
- ☐ 1
- ☐ 25

Правильно

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 балл

- ☒ −1
- ☐ 1
- ☐  $\sqrt{2}$
- ☐ 0

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

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

Правильно

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 балл

- ☒  $\frac{1}{2}$
- ☐  $\sqrt{20}$
- ☐ 2
- ☐ 4

Правильно

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.