

**Practice Problems for X-Y Coordinates and Graphs**  
from [www.topmath.info](http://www.topmath.info)

1 What is the slope of the perpendicular bisector of the line segment between (0,3) and (-3,-6) ?

2 At what point does the line that contains (4,-3) and has slope 3 pass through the Y axis?

3 The function  $f(x)$  is linear. When  $x=9$ ,  $f(x) = 41$ , and when  $x=14$ ,  $f(x) = 61$ . Write the equation that defines  $f(x)$ .

4 What point is 7 units above (9,6)?

5 What point is 6 units to the right of (4,8)?

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6 The points  $(9,-16)$ ,  $(18,-11)$ , and  $(9,-11)$  are three corners of a rectangle. What is the fourth point?

7 What point is 9 units above  $(-13,-9)$ ?

8 What point is 5 units to the right of  $(-1,8)$ ?

9 What is the slope of the line  $y = -x$ ?

10 What is the slope of the line  $y = x/7$  ?

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11 What is the slope of the line whose equation is  $11x - y = 4$ ?

12 What is the slope of the line  $y = x/8$  ?

13 What is the slope of the line  $y = x/9 + 6$  ?

14 What is the slope of the line  $y = x/6 + 6$  ?

15 What are the coordinates of the point at which the line that contains  $(-1,-4)$  and  $(0,-5)$  passes through the Y axis?

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1 ANSWER:  $-1/3$ . EXPLANATION: The slope of the line segments between the given points is  $(-6 - 3) / (-3 - 0)$ . The slope of any line perpendicular to this line segment is the negative reciprocal of this slope.

2 ANSWER:  $(0, -15)$ . EXPLANATION: The equation  $y = mx + b$  is the same as  $b = y - mx$ . Plugging in the coordinates of the point and the slope ( $m$ ), we calculate  $b$ , the y-intercept, as  $b = -3 - (3 * 4)$ , which simplifies to  $-15$ . The x-coordinate of the y-intercept, of course, is  $0$ , so the point is  $(0, -15)$ .

3 ANSWER:  $f(x) = 4x + 5$ . EXPLANATION: When  $x$  goes from  $9$  to  $14$ , (a change of  $5$ ),  $f(x)$  changes by  $20$ . Dividing the change in  $f(x)$  by the change in  $x$ , we get the slope, which is  $4$ . The equation of the line is therefore of the form  $f(x) = 4x + k$ . We can now plug in either pair of known values for  $x$  and  $f(x)$  to solve for  $k$ .

4 ANSWER:  $(9, 13)$

5 ANSWER:  $(10, 8)$

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6 ANSWER: (18,-16). EXPLANATION: Since one X value appears twice, and one Y value appears twice, the fourth point must be the one that would make the other X and Y values appear twice in the completed list of points.

7 ANSWER: (-13,0)

8 ANSWER: (4,8)

9 ANSWER: -1

10 ANSWER:  $\frac{1}{7}$

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11 ANSWER: 11. EXPLANATION: Subtract  $11x$  from each side to make the equation read  $y = -11x + 4$ . Now multiply both sides by  $-1$ , and the equation reads  $y = 11x - 4$ . This is now in the form  $y = mx + b$ , where  $m$  ( $11$ ) is the slope.

12 ANSWER:  $-1/8$

13 ANSWER:  $1/9$

14 ANSWER:  $-1/6$

15 ANSWER:  $(0,-5)$ . EXPLANATION: The X-coordinate of the Y-intercept will be  $0$ , by definition. The slope of the line is the change in Y divided by the change in X, in this case,  $(-5 - -4) / (0 - -1)$ , which equals  $-1$ . Going from the first point,  $(-1,-4)$ , to the Y axis requires a move of  $1$  units in the X direction. Multiplying this value by the slope, we see that we must move by  $-1$  units in the Y direction from  $(-1,-4)$ , which means the line intersects the Y axis at  $(0,-5)$ .