# Cartesian Coordinate System

*Answer Key*

**1) Answer: C**
**Explanation:** The point (-5, -7) consists of both negative first and second components. Coordinates that consist of negative first and second components are located in the third quadrant of the coordinate plane.

**2) Answer: A**
**Explanation:** Write the given linear equation in its slope-intercept form to determine its slope. This can be achieved by solving for *y* in terms of *x*.

We start by transposing *3x* to the right-hand side so that *2y* will be the only quantity remaining on the left-hand side.

3x + 2y = 1

2y = -3x + 1 *Transposition method*

Removing 2 in *2y*:

$\frac{2y}{2} = \frac{-3x+1}{2}$ *Dividing both sides by 2*

$y = -\frac{3}{2}x + \frac{1}{2}$

We know that the slope of the line is the coefficient of *x* when the line is expressed in its slope-intercept form. Since the coefficient of *x* in $y = -\frac{3}{2}x + \frac{1}{2}$ is -3/2, then the slope of the line is -3/2.

**3) Answer: A**
**Explanation:** A line has two intercepts: the *x* and *y* intercepts. To find the x-intercept, we let *y* = *0* then solve for the value of *x*:

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5x - 2y = 10
5x - 2(0) = 10 *Let y = 0*
5x = 10
$\frac{5x}{5} = \frac{10}{5}$ *Dividing both sides of the equation by 5*

x = 2

Thus, the x-intercept is the point (2, 0).

To find the y-intercept, we let *x = 0* then solve for the value of *y*:

5x - 2y = 10
5(0) - 2y = 10 *Set x = 0*
-2y = 10
$\frac{-2y}{-2} = \frac{10}{-2}$ *Dividing both sides of the equation by -2*
y = -5

Hence, the y-intercept is (0, -5).

Thus, the intercepts of the line are (2,0) and (0, -5).

**4) Answer: D**
**Explanation:** If two lines are perpendicular, then their slopes are negative reciprocal of each other. This means that the slope of line A is the negative reciprocal of the slope of line B.

Line B is defined as *2x - y = 5*. We can use the slope of Line B to determine the slope of Line A knowing that these two lines are perpendicular to each other and have slopes that are negative reciprocal of each other.

Let us determine the slope of *2x - y = 5*.

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We start by writing *2x - y = 5* in its slope-intercept form.

2x - y = 5

-y = -2x + 5 — *Isolating y from other variable (transposition method)*

$\frac{-y}{-1} = \frac{-2x}{-1} + \frac{5}{-1}$ — *Dividing both sides by -1 so the only expression on the left-hand side is y*

*y = 2x - 5*

We know that the slope of a line is the coefficient of *x* when it is written in the slope-intercept form. As we can see, the coefficient of *x* is 2 in *y = 2x - 5.* Therefore, the slope of Line B is 2.

Now that we know the slope of Line B, we can deduce the slope of Line A. Since Line A is perpendicular to Line B, then the slope of Line A is the negative reciprocal of the slope of Line B. The slope of Line B is 2 and its negative reciprocal is simply -½ .

Therefore, the slope of Line A is -½ .

**5) Answer: D**

**Explanation:** The line (or linear equation) $y = \frac{1}{4}x - 2$ passes through the point *( k, -1)*, which means that if we replace *x* with *k* in the linear equation, we will obtain a value of y that is -1. In simple words, *(k, -1)* satisfies $y = \frac{1}{4}x - 2$.

Thus, to determine the value of *k,* we let *x = k* and *y = -1* in the given linear equation:

$-1 = \frac{1}{4}(k) - 2$

We eliminate the denominator in the equation by multiplying both sides of the equation by 4:

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$4(-1) = 4(\frac{1}{4}(k) - 2)$

$-4 = k - 8$

Now, continue solving the resulting equation above:

| | |
|---|---|
| $8 + (-4) = k$ | *Transposition method* |
| $4 = k$ | |
| $k = 4$ | *Symmetric property of equality* |

Thus, the value of k must be 4.