Topic: Testing for functions

Question: Does the equation represent a function?

$$2x^2 + 2y^2 = 18$$

Answer choices:

A Yes, because there are values of x that will give multiple values for y.

B No, because there are values of x that will give multiple values for y.

C No, because every value of x will give a unique value for y.

D Yes, because every value of x will give a unique value for y.

Solution: B

Solve the equation for y.

$$2x^2 + 2y^2 = 18$$

$$x^2 + y^2 = 9$$

$$y^2 = 9 - x^2$$

$$y = \pm\sqrt{9 - x^2}$$

Now that we have the equation in this form, we can find values of x that return multiple y-values. For instance, at $x = 1$,

$$y = \pm\sqrt{9 - 1^2}$$

$$y = \pm\sqrt{8}$$

$$y = \pm 2\sqrt{2}$$

Because the equation takes on the values $y = -2\sqrt{2}$ and $y = 2\sqrt{2}$ at the single value $x = 1$, we know the equation doesn't represent a function.

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Question: Which of these could represent a function?

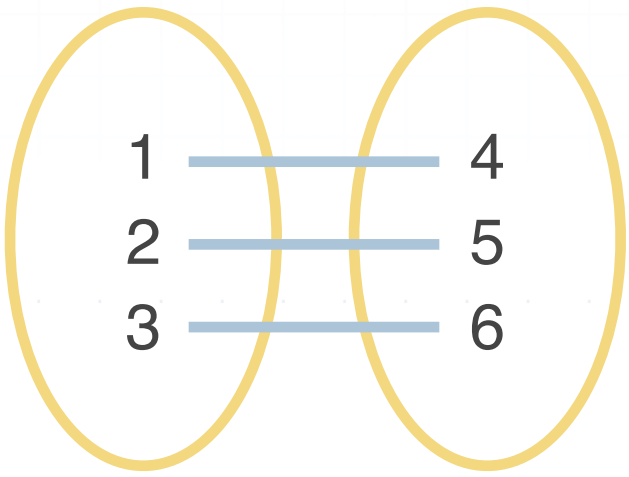
Answer choices:

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

B The relation whose graph consists of the points with coordinates $(1,2)$, $(1,3)$, and $(1,4)$.

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

D



Solution: D

Answer choice D is the only expression that could represent a function, because it's the only answer choice that shows just one y-value for every x -value.

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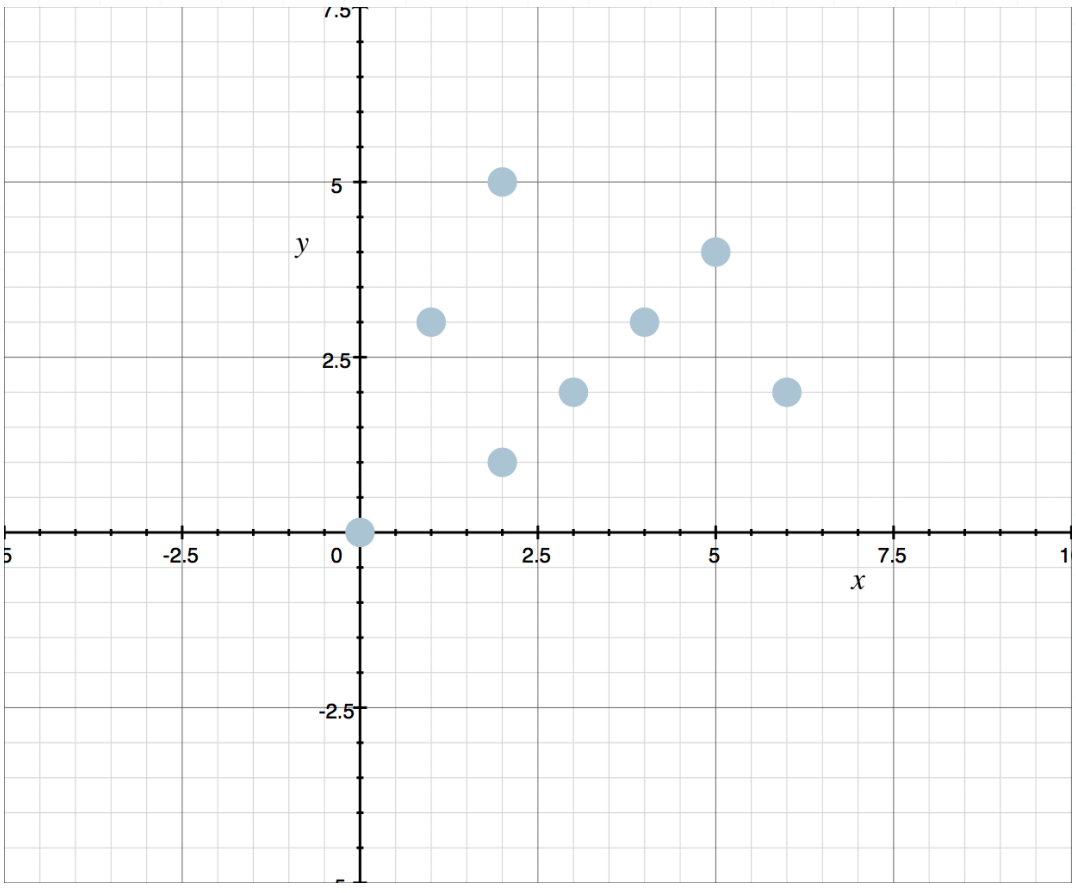
Question: The graph shows eight points that define a relation between x and y. Identify the pair of points which prove that the relation is not a function.



Answer choices:

A $(1,3)$ and $(4,3)$

B $(5,4)$ and $(2,1)$

C $(3,2)$ and $(6,2)$

D $(2,1)$ and $(2,5)$

Solution: D

If one x-value gives two different y-values, then the relation is not a function.

Answer choice D shows $x = 2$, $y = 1$ and $x = 2$, $y = 5$. In other words, the same x-value but two different y-values. Therefore, we know that the relation is not a function.