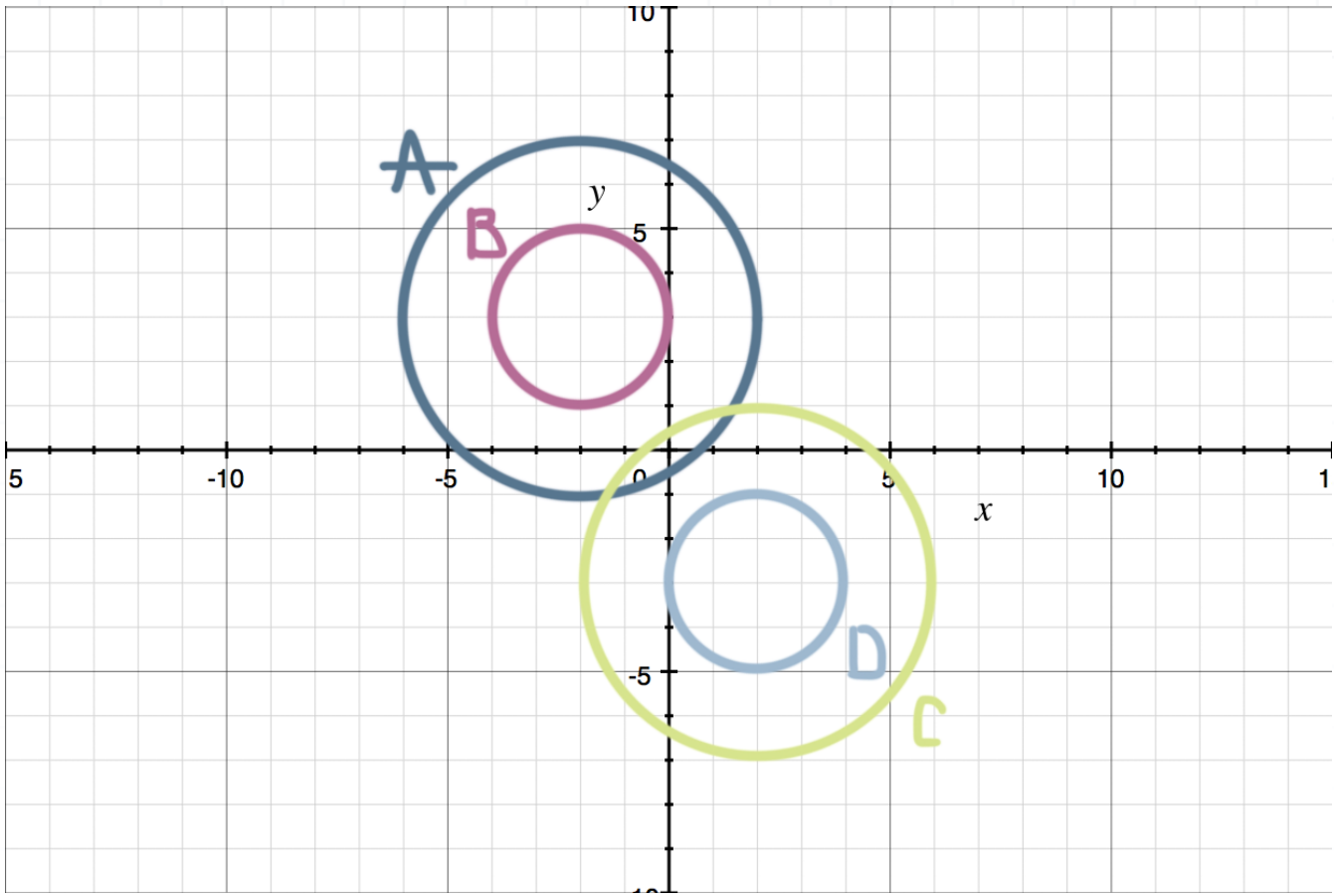


Topic: Graphing circles

Question: Which circle is the graph of $(x - 2)^2 + (y + 3)^2 = 4$?



Answer choices:

- A A
- B B
- C C
- D D



Solution: D

Given

$$(x - 2)^2 + (y + 3)^2 = 4$$

we can put this in the form $(x - h)^2 + (y - k)^2 = r^2$ by rewriting it.

$$(x - 2)^2 + [y - (-3)]^2 = 2^2$$

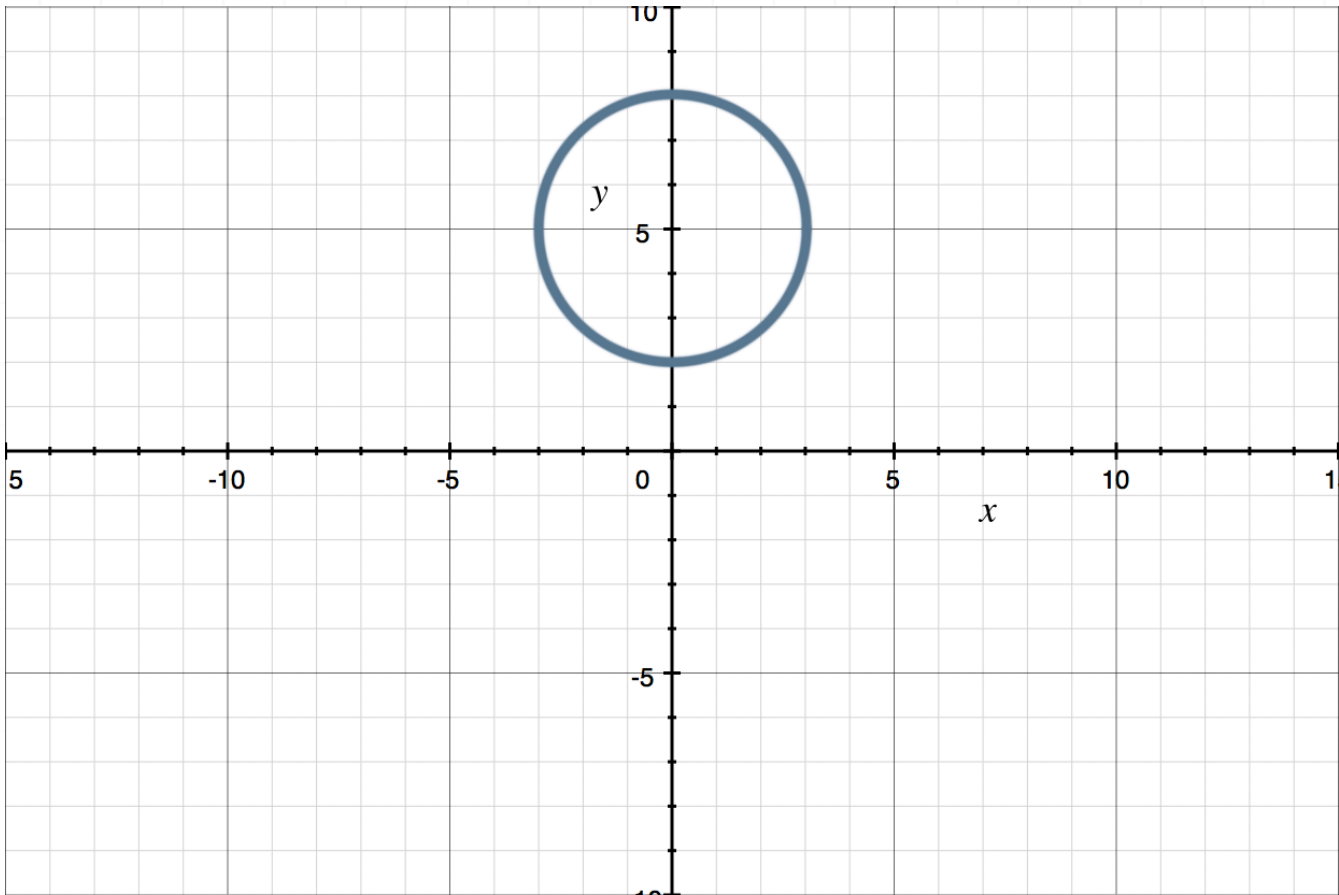
We can see that $h = 2$, $k = -3$, and $r = 2$.

The circle with center at $(2, -3)$ and radius 2 is D.



Topic: Graphing circles

Question: What is the equation of the given circle?



Answer choices:

- A $x^2 - 10x + y^2 + 16 = 0$
- B $x^2 + y^2 + 10y + 16 = 0$
- C $x^2 + y^2 - 10y + 16 = 0$
- D $x^2 + 10x + y^2 + 16 = 0$



Solution: C

The points $(3,5)$ and $(-3,5)$ are at opposite ends of a diameter of this circle. They both have a y -coordinate of 5, so the center of the circle also has a y -coordinate of 5 and it lies halfway between them.

The distance between the points $(3,5)$ and $(-3,5)$ is the difference in their x -coordinates, which is $3 - (-3) = 6$, so the center of the circle is at a distance of 3 units from both of those points. Therefore, the center of the circle is at the point $(0,5)$, and it has a radius of 3. That tells us that $h = 0$, $k = 5$, and $r = 3$.

Substitute the values of h , k , and r into the equation $(x - h)^2 + (y - k)^2 = r^2$, then expand and simplify.

$$(x - 0)^2 + (y - 5)^2 = 3^2$$

$$x^2 + y^2 - 10y + 25 = 9$$

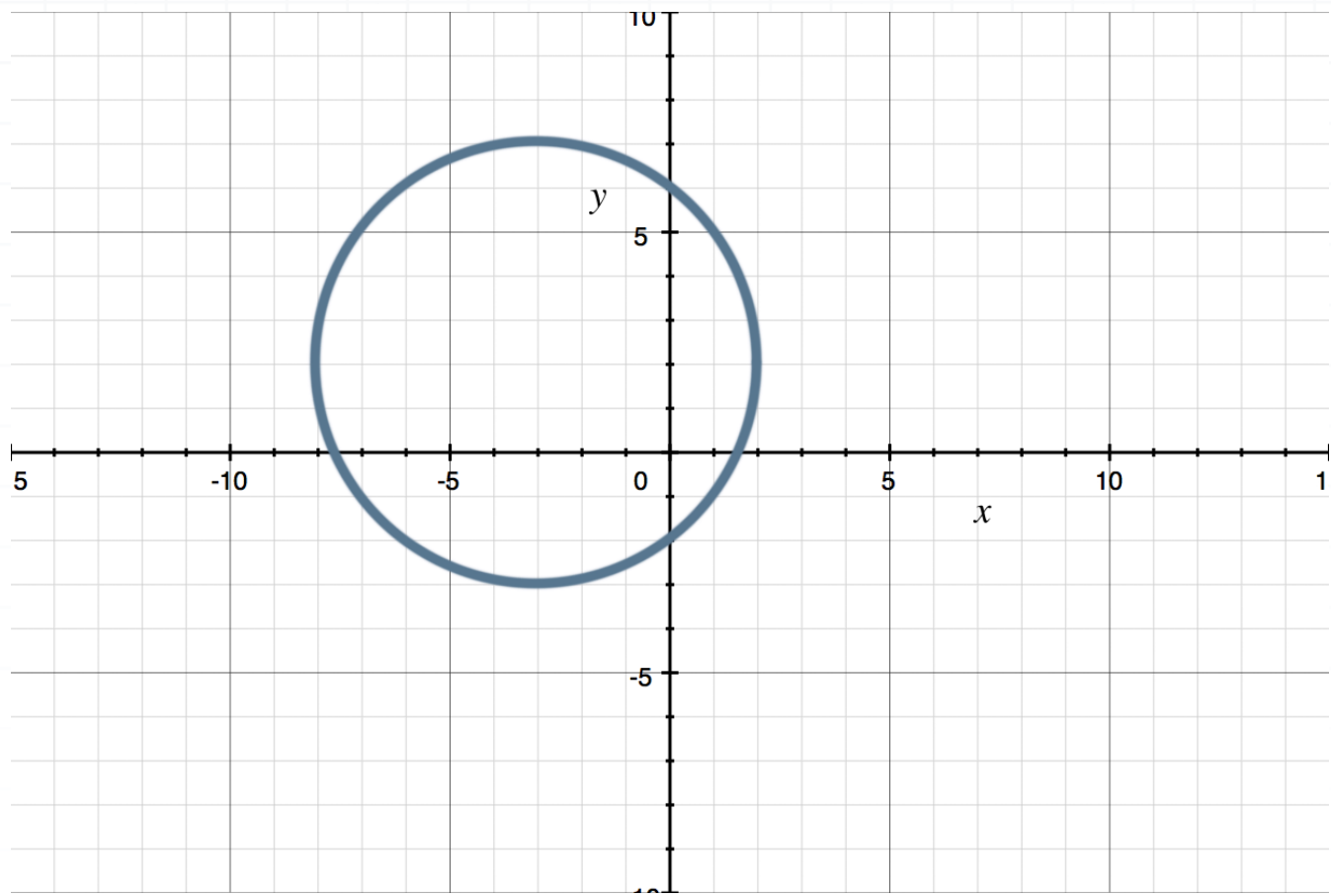
$$x^2 + y^2 - 10y + 16 = 0$$

This matches answer choice C.



Topic: Graphing circles

Question: What is the equation of the given circle?



Answer choices:

- A $x^2 + 6x + y^2 - 4y = 12$
- B $x^2 - 6x + y^2 + 4y = 12$
- C $x^2 + 6x + y^2 - 4y = -12$
- D $x^2 + 6x + y^2 - 4y = 25$



Solution: A

The points $(-3, 7)$ and $(-3, -3)$ are at opposite ends of a diameter of this circle. They both have an x -coordinate of -3 , so the center of the circle also has an x -coordinate of -3 and it lies halfway between them.

The distance between the points $(-3, 7)$ and $(-3, -3)$ is the difference in their y -coordinates, which is $7 - (-3) = 10$, so the center of the circle is at a distance of 5 units from both of those points. Therefore, the center of the circle is at the point $(-3, 2)$, and it has a radius of 5. That tells us that $h = -3$, $k = 2$, and $r = 5$.

Substitute the values of h , k , and r into the equation $(x - h)^2 + (y - k)^2 = r^2$, then expand and simplify.

$$[x - (-3)]^2 + (y - 2)^2 = 5^2$$

$$(x + 3)^2 + (y - 2)^2 = 5^2$$

$$x^2 + 6x + 9 + y^2 - 4y + 4 = 25$$

$$x^2 + 6x + y^2 - 4y = 12$$

This matches answer choice A.

