SAT "Equation of a Circle" Practice Problems Worksheet

Over the past few years, the College Board has transitioned from practically never asking about the equation for graphing a circle to now asking it on just about every test (I would say "every test," but there is always that possibility it may not be on one test as a rare exception). For reference, here's the equation for graphing a circle:

For a circle with center (h, k), $(x-h)^2 + (y-k)^2 = Radius^2$

The good news is that the questions they use to test your knowledge of this concept are not varied; in fact, there are only three ways I have seen them actually test this concept, and the three question types are seen in questions 1-3 (here's the equation, now identify the center and radius), 4-5 (here's the center and radius, now identify the equation), and 6-8 (reformat the given equation to look like the equation for graphing a circle by completing the square, then identify the center or radius). If you can do these problems, then you're good for this question type.

1. $(x-8)^2 + (y-6)^2 = 36$

   For the equation above, what is the coordinate point for the center of the circle as well as the circle's radius?

A) Center: (-8, -6), Radius: 36
B) Center: (8, 6), Radius: 36
C) Center: (-8, -6), Radius: 6
D) Center: (8, 6), Radius: 6

2. $(x+14)^2 + (y+2)^2 = 64$

   For the equation above, what is the coordinate point for the center of the circle as well as the circle's radius?

A) Center: (14, 2), Radius: 8
B) Center: (14, 2), Radius: 64
C) Center: (-14, -2), Radius: 8
D) Center: (-14, -2), Radius: 64

3. $(x-11)^2 + (y+4)^2 = 49$

   For the equation above, what is the coordinate point for the center of the circle as well as the circle's radius?

A) Center: (11, -4), Radius: 7
B) Center: (11, -4), Radius: 49
C) Center: (-11, 4), Radius: 49
D) Center: (-11, 4), Radius: 7

4. Find the equation of a circle with center (12, -3) and a radius of 3:

A) $(x-12)^2 + (y+3)^2 = 3$
B) $(x-12)^2 + (y+3)^2 = 9$
C) $(x+12)^2 + (y-3)^2 = 3$
D) $(x+12)^2 + (y-3)^2 = 9$

5. Find the equation of a circle with center (-7, 11) and a radius of 9:

A) $(x + 7)^2 + (y - 11)^2 = 81$

B) $(x + 7)^2 + (y + 11)^2 = 9$

C) $(x - 7)^2 + (y - 11)^2 = 81$

D) $(x - 7)^2 + (y + 11)^2 = 9$

$$x^2 + 10x + y^2 - 6y = -18$$

6. The graph of the equation shown above is a circle. What is the radius of the circle?

A) 3

B) 4

C) 5

D) 9

$$x^2 + 18x + y^2 - 8y = -48$$

7. The graph of the equation shown above is a circle. What is the radius of the circle?

A) 4

B) 5

C) 6

D) 7

$$x^2 - 4x + y^2 + 6y = 87$$

8. The graph of the equation shown above is a circle. What is the coordinate point of the center of the circle?

A) (13, 10)

B) (4, 13)

C) (-4, 6)

D) (2, -3)

Answer Key:

1. D
2. C
3. A
4. B
5. A
6. B
7. D
8. D