

Equation of a circle: $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is center and r is radius

So, for example, the graph of $(x - 4)^2 + (y + 2)^2 = 9$ is a circle with center $(4, -2)$ and radius 3.

The graph of $(x + 3)^2 + y^2 = 36$ is a circle with center $(_, _)$ and radius $_.$

The graph of $(x + 8)^2 + (y - 5)^2 = 100$ is a circle with center $(_, _)$ and radius $_.$

The graph of $(x - 7)^2 + (y - 2)^2 = 16$ is a circle with center $(_, _)$ and radius $_.$

The graph of $(x + 12)^2 + (y + 1)^2 = 64$ is a circle with center $(_, _)$ and radius $_.$

The left side of the circle equation must contain *only* squared terms. (These questions above not on answer key)

$$x^2 + y^2 + 10y = 24$$

1. The equation of a circle in the xy -plane is show above. What is the radius of the circle?

- A) 5
- B) 6
- C) 7
- D) 8

$$x^2 + y^2 + 8x - 2y = 19$$

2. The equation of a circle in the xy -plane is show above. What is the radius of the circle?

- A) 2
- B) 3
- C) 4
- D) 6

$$x^2 + y^2 - 12x - 6y = 36$$

3. The equation of a circle in the xy -plane is show above. What is the radius of the circle?
- A) 6
 - B) 7
 - C) 8
 - D) 9

$$x^2 + y^2 + 10x - 12y = 3$$

4. The equation of a circle in the xy -plane is show above. What is the radius of the circle?
- A) 6
 - B) 7
 - C) 8
 - D) 9

$$x^2 + y^2 - 14x - 4y = 28$$

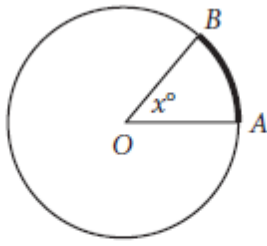
5. The equation of a circle in the xy -plane is show above. What is the radius of the circle?
- A) 6
 - B) 7
 - C) 8
 - D) 9

$$(x + 4)^2 + (y - 2)^2 = 36$$

6. In the xy -plane, the graph of the equation above is a circle. Point P is on the circle and has coordinates $(-10, 2)$. If PQ is a diameter of the circle, what are the coordinates of point Q ?
- A) $(-4, 8)$
 - B) $(-4, 2)$
 - C) $(-4, -4)$
 - D) $(2, 2)$

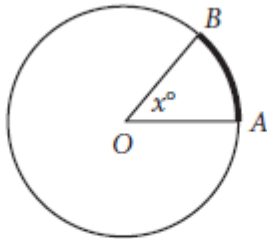
$$(x - 1)^2 + (y + 7)^2 = 25$$

7. In the xy -plane, the graph of the equation above is a circle. Point P is on the circle and has coordinates $(1, -2)$. If PQ is a diameter of the circle, what are the coordinates of point Q ?
- A) $(6, -7)$
 - B) $(-4, -7)$
 - C) $(1, -7)$
 - D) $(1, -12)$
8. In the xy -plane, the points $(3, 5)$ and $(-3, -5)$ are the endpoints of a diameter of a circle. Which of the following is an equation of the circle? [more difficult]
- A) $(x - 3)^2 + (y - 5)^2 = 136$
 - B) $(x - 3)^2 + (y - 5)^2 = 34$
 - C) $x^2 + y^2 = 136$
 - D) $x^2 + y^2 = 34$
9. In the xy -plane, the points $(1, 6)$ and $(-1, -6)$ are the endpoints of a diameter of a circle. Which of the following is an equation of the circle?
- A) $(x - 1)^2 + (y - 6)^2 = 49$
 - B) $(x - 1)^2 + (y - 6)^2 = 37$
 - C) $x^2 + y^2 = 49$
 - D) $x^2 + y^2 = 37$



Note: Figure not drawn to scale.

10. In the figure above, the circle has center O and has radius 6. If the length of arc \widehat{AB} (shown in bold) is between 4 and 5, what is one possible integer value of x ?



Note: Figure not drawn to scale.

11. In the figure above, the circle has center O and has radius 7. If the length of arc \widehat{AB} (shown in bold) is between 4 and 5, what is one possible integer value of x ?

$$2x^2 + 2y^2 + 8x - 12y = 24$$

12. The equation of a circle in the xy -plane is show above. What are the center and radius of the circle?

- A) center $(-2, 3)$, radius 4
- B) center $(2, -3)$, radius 4
- C) center $(-2, 3)$, radius 5
- D) center $(2, -3)$, radius 5

$$3x^2 + 3y^2 - 9x + 24y = 53.25$$

13. The equation of a circle in the xy -plane is show above. What is the radius of the circle?

- A) 4
- B) 5
- C) 6
- D) 7

14. The expression $\frac{4x-6}{x+2}$ is equivalent to which of the following?

- A) $\frac{4-6}{3}$
- B) $4 - \frac{14}{x+2}$
- C) $4 + \frac{2}{x+2}$
- D) $4 + \frac{14}{x+2}$

15. The expression $\frac{6x-5}{x+2}$ is equivalent to which of the following?

- A) $\frac{6-5}{3}$
- B) $6 - \frac{7}{x+2}$
- C) $6 + \frac{7}{x+2}$
- D) $6 - \frac{17}{x+2}$

16. The expression $\frac{2x+7}{x-3}$ is equivalent to which of the following?

- A) $\frac{2+7}{3}$
- B) $2 - \frac{1}{x-3}$
- C) $2 + \frac{1}{x-3}$
- D) $2 + \frac{13}{x-3}$

17. The expression $\frac{3x-4}{x-6}$ is equivalent to which of the following?

- A) $3 - \frac{22}{x-6}$
- B) $3 - \frac{14}{x-6}$
- C) $3 + \frac{14}{x-6}$
- D) $3 + \frac{22}{x-6}$

18. The expression $\frac{3x-5}{x+4}$ is equivalent to which of the following?

- A) $3 - \frac{17}{x+4}$
- B) $3 - \frac{7}{x+4}$
- C) $3 + \frac{7}{x+4}$
- D) $3 + \frac{17}{x+4}$

19. The expression $\frac{4x+2}{x+3}$ is equivalent to which of the following?

- A) $4 + \frac{14}{x+3}$
- B) $4 + \frac{10}{x+3}$
- C) $4 - \frac{10}{x+3}$
- D) $4 - \frac{14}{x+3}$

20. The expression $\frac{3x^2+5x}{x+2}$ is equivalent to which of the following?

- A) $3x - \frac{1}{x+2}$
- B) $3x + 11 - \frac{2}{x+2}$
- C) $3x - 1 + \frac{2}{x+2}$
- D) $3x - 1 - \frac{2}{x+2}$

21. The expression $\frac{4x^2-3x}{x+3}$ is equivalent to which of the following?

- A) $4x - 15 + \frac{45}{x+3}$
- B) $4x - 15 - \frac{45}{x+3}$
- C) $4x - 9 - \frac{27}{x+3}$
- D) $4x - 9 + \frac{27}{x+3}$

22. The expression $\frac{2x^2-5x}{x-2}$ is equivalent to which of the following?

- A) $2x - 1$
- B) $2x - 1 - \frac{2}{x-2}$
- C) $2x - 1 + \frac{2}{x-2}$
- D) $2x + 1 - \frac{2}{x-2}$

23. The expression $\frac{2x^2+7x}{x+1}$ is equivalent to which of the following?

- A) $2x + 5 - \frac{5}{x+1}$
- B) $2x + 5 + \frac{5}{x+1}$
- C) $2x + 9 - \frac{27}{x+1}$
- D) $2x + 9 + \frac{27}{x+1}$

24. The expression $\frac{7x^2+8x}{x+2}$ is equivalent to which of the following?

- A) $7x - \frac{1}{x+2}$
- B) $7x - 6 - \frac{12}{x+2}$
- C) $7x - 6 + \frac{12}{x+2}$
- D) $7x + 6 - \frac{12}{x+2}$

25. The expression $\frac{5x^2-8x}{x-4}$ is equivalent to which of the following?

A) $5x - 12$

B) $5x - 12 - \frac{48}{x-4}$

C) $5x + 12 + \frac{48}{x-4}$

D) $5x + 12 - \frac{48}{x-4}$

[Guess Small Numbers]

26. If $x^{y-x} = 9$ for positive integers x and y , which of the following is a possible value of y ?

(A) 3

(B) 4

(C) 5

(D) 6

27. If $x^{x-y} = 49$ for positive integers x and y , which of the following is a possible value of y ?

(A) 2

(B) 3

(C) 4

(D) 5

28. If $x^{x+y} = 8$ for positive integers x and y , which of the following is a possible value of y ?

(A) 1

(B) 2

(C) 3

(D) 4

Answers:

1. C
2. D
3. D
4. C
5. D
6. D
7. D
8. D
9. D
10. Any of these: 39,40,41,42,43,44,45,46,47
11. Any of these: 33, 34, 35, 36, 37, 38, 39, 40
12. C
13. C
14. B
15. D
16. D
17. C
18. A
19. C
20. C
21. A
22. B
23. A
24. C
25. C
26. C
27. D
28. A