

G.GPE.A.1: Equations of Circles 5a

- 1 Which point is on the circle whose equation is $x^2 + y^2 = 289$?
 - 1) $(-12, 12)$
 - 2) $(7, -10)$
 - 3) $(-1, -16)$
 - 4) $(8, -15)$

- 2 Which equation represents a circle whose center is the origin and that passes through the point $(-4, 0)$?
 - 1) $x^2 + y^2 = 8$
 - 2) $x^2 + y^2 = 16$
 - 3) $(x + 4)^2 + y^2 = 8$
 - 4) $(x + 4)^2 + y^2 = 16$

- 3 A circle whose center has coordinates $(-3, 4)$ passes through the origin. What is the equation of the circle?
 - 1) $(x + 3)^2 + (y - 4)^2 = 5$
 - 2) $(x + 3)^2 + (y - 4)^2 = 25$
 - 3) $(x - 3)^2 + (y + 4)^2 = 5$
 - 4) $(x - 3)^2 + (y + 4)^2 = 25$

- 4 What is the equation of the circle with its center at $(-1, 2)$ and that passes through the point $(1, 2)$?
 - 1) $(x + 1)^2 + (y - 2)^2 = 4$
 - 2) $(x - 1)^2 + (y + 2)^2 = 4$
 - 3) $(x + 1)^2 + (y - 2)^2 = 2$
 - 4) $(x - 1)^2 + (y + 2)^2 = 2$

- 5 What is the equation of the circle passing through the point $(6, 5)$ and centered at $(3, -4)$?
 - 1) $(x - 6)^2 + (y - 5)^2 = 82$
 - 2) $(x - 6)^2 + (y - 5)^2 = 90$
 - 3) $(x - 3)^2 + (y + 4)^2 = 82$
 - 4) $(x - 3)^2 + (y + 4)^2 = 90$

- 6 Which equation represents a circle with its center at $(2, -3)$ and that passes through the point $(6, 2)$?
 - 1) $(x - 2)^2 + (y + 3)^2 = \sqrt{41}$
 - 2) $(x + 2)^2 + (y - 3)^2 = \sqrt{41}$
 - 3) $(x - 2)^2 + (y + 3)^2 = 41$
 - 4) $(x + 2)^2 + (y - 3)^2 = 41$

- 7 What is the equation of a circle with its center at $(0, -2)$ and passing through the point $(3, -5)$?
 - 1) $x^2 + (y + 2)^2 = 9$
 - 2) $(x + 2)^2 + y^2 = 9$
 - 3) $x^2 + (y + 2)^2 = 18$
 - 4) $(x + 2)^2 + y^2 = 18$

- 8 What is the equation of the circle passing through the point $(-5, -2)$ whose center is at $(-2, 3)$?
 - 1) $(x + 5)^2 + (y + 2)^2 = 34$
 - 2) $(x + 5)^2 + (y + 2)^2 = 50$
 - 3) $(x + 2)^2 + (y - 3)^2 = 34$
 - 4) $(x + 2)^2 + (y - 3)^2 = 50$

9 Which equation represents the circle whose center is $(-5,3)$ and that passes through the point $(-1,3)$?

- 1) $(x + 1)^2 + (y - 3)^2 = 16$
- 2) $(x - 1)^2 + (y + 3)^2 = 16$
- 3) $(x + 5)^2 + (y - 3)^2 = 16$
- 4) $(x - 5)^2 + (y + 3)^2 = 16$

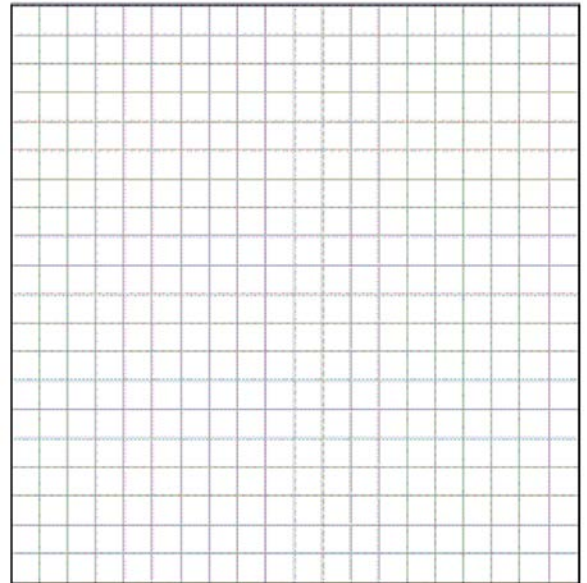
10 The coordinates of the endpoints of the diameter of a circle are $(2,0)$ and $(2,-8)$. What is the equation of the circle?

- 1) $(x - 2)^2 + (y + 4)^2 = 16$
- 2) $(x + 2)^2 + (y - 4)^2 = 16$
- 3) $(x - 2)^2 + (y + 4)^2 = 8$
- 4) $(x + 2)^2 + (y - 4)^2 = 8$

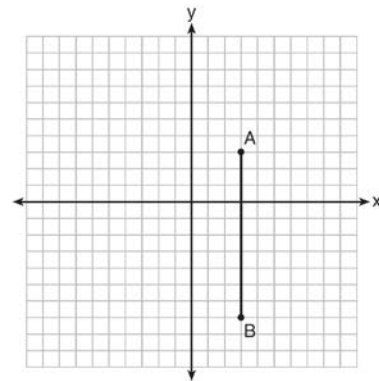
11 The diameter of a circle has endpoints at $(-2,3)$ and $(6,3)$. What is an equation of the circle?

- 1) $(x - 2)^2 + (y - 3)^2 = 16$
- 2) $(x - 2)^2 + (y - 3)^2 = 4$
- 3) $(x + 2)^2 + (y + 3)^2 = 16$
- 4) $(x + 2)^2 + (y + 3)^2 = 4$

12 Write an equation of the circle whose diameter \overline{AB} has endpoints $A(-4,2)$ and $B(4,-4)$. [The use of the grid below is optional.]



13 The graph below shows \overline{AB} , which is a chord of circle O . The coordinates of the endpoints of \overline{AB} are $A(3,3)$ and $B(3,-7)$. The distance from the midpoint of \overline{AB} to the center of circle O is 2 units.



What could be a correct equation for circle O ?

- 1) $(x - 1)^2 + (y + 2)^2 = 29$
- 2) $(x + 5)^2 + (y - 2)^2 = 29$
- 3) $(x - 1)^2 + (y - 2)^2 = 25$
- 4) $(x - 5)^2 + (y + 2)^2 = 25$

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Answer Section

1 ANS: 4

$$x^2 + y^2 = 289$$

$$8^2 + (-15)^2 = 289$$

$$64 + 225 = 289$$

REF: 010625a

2 ANS: 2

REF: 061524ge

3 ANS: 2

REF: 011511ge

4 ANS: 1

REF: 011423ge

5 ANS: 4

$$r = \sqrt{(6-3)^2 + (5-(-4))^2} = \sqrt{9+81} = \sqrt{90}$$

REF: 061415a2

6 ANS: 3

$$r = \sqrt{(6-2)^2 + (2-(-3))^2} = \sqrt{16+25} = \sqrt{41}$$

REF: 081516a2

7 ANS: 3

$$r = \sqrt{(3-0)^2 + (-5-(-2))^2} = \sqrt{9+9} = \sqrt{18}$$

REF: 011624a2

8 ANS: 3

$$r = \sqrt{(-5-(-2))^2 + (-2-3)^2} = \sqrt{9+25} = \sqrt{34}$$

REF: 061620a2

9 ANS: 3

REF: 061306ge

10 ANS: 1

$$\left(\frac{2+2}{2}, \frac{0+(-8)}{2} \right) = (2, -4) \quad \sqrt{(2-2)^2 + (-8-0)^2} = 8 = d$$

$$4 = r$$

$$16 = r^2$$

REF: 061428ge

11 ANS: 1

$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{3+3}{2} = 3$. The center is (2,3). $d = \sqrt{(-2-6)^2 + (3-3)^2} = \sqrt{64+0} = 8$. If the diameter is 8, the radius is 4 and $r^2 = 16$.

REF: fall0820ge

12 ANS:

$$\text{Midpoint: } \left(\frac{-4+4}{2}, \frac{2+(-4)}{2} \right) = (0, -1). \text{ Distance: } d = \sqrt{(-4-4)^2 + (2-(-4))^2} = \sqrt{100} = 10$$

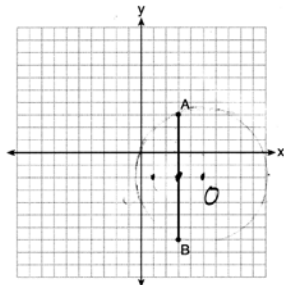
$$r = 5$$

$$r^2 = 25$$

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

REF: 061037ge

13 ANS: 1



Since the midpoint of \overline{AB} is $(3, -2)$, the center must be either $(5, -2)$ or $(1, -2)$.

$$r = \sqrt{2^2 + 5^2} = \sqrt{29}$$

REF: 061623geo