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

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 What is an equation of a circle whose center is at $(2,-4)$ and is tangent to the line $x=-2$?

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

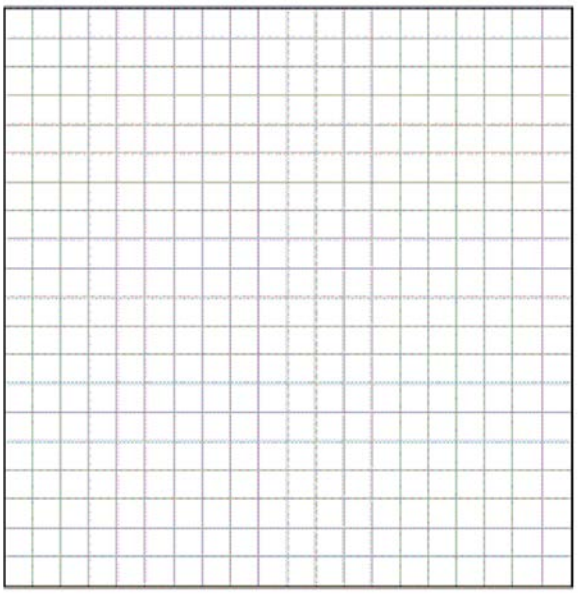
11 The coordinates of the endpoints of the diameter of a circle are $(2,0)$ and $(2,-8)$. What is the equation of the circle?

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

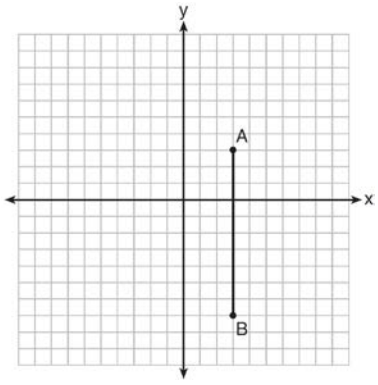
12 The diameter of a circle has endpoints at $(-2,3)$ and $(6,3)$. What is an equation of the circle?

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

13 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.]



14 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: 2

The line $x = -2$ will be tangent to the circle at $(-2,-4)$. A segment connecting this point and $(2,-4)$ is a radius of the circle with length 4.

REF: 012020geo

11 ANS: 1

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

$4 = r$

$16 = r^2$

REF: 061428ge

12 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

13 ANS:

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

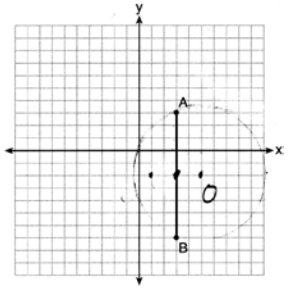
$$r = 5$$

$$r^2 = 25$$

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

REF: 061037ge

14 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