

Write the equation using the information.

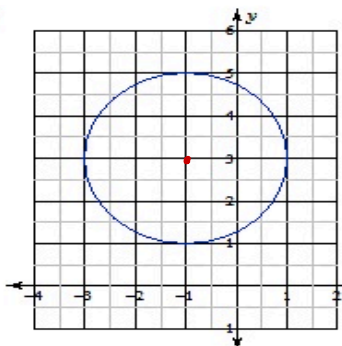
1. Center: (0, 0), Radius: 9

$$x^2 + y^2 = 81$$

2. Center: (13, -12), Radius: 4

$$(x - 13)^2 + (y + 12)^2 = 16$$

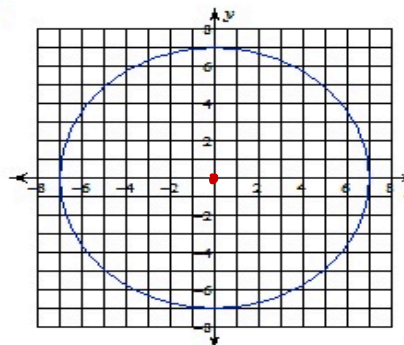
- 3.



Center (-1, 3)
Radius 4

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

- 4.

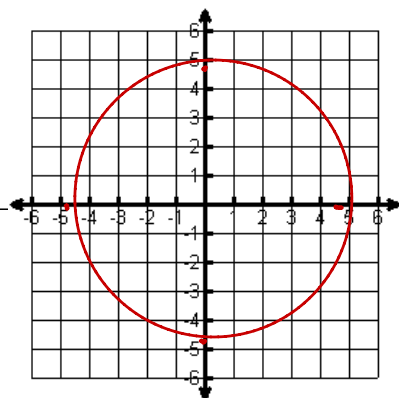


Center (0, 0)
Radius 7

$$x^2 + y^2 = 49$$

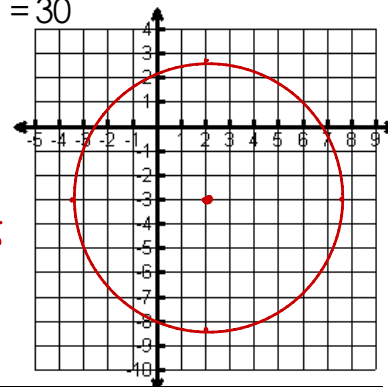
Graph the following circles. State the center and radius.

1. $x^2 + y^2 = 24$



Center: (0, 0)
Radius: $\frac{2\sqrt{6}}{1} \approx 4.9$

2. $(x - 2)^2 + (y + 3)^2 = 30$



Center: (2, -3)
Radius: $\sqrt{30} \approx 5.5$

Write the standard equation for the circle. State the center and radius.

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

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

Center: (5, 1) radius: 4

4. $x^2 + y^2 - 8x + 4y - 6 = 0$

$$(x - 4)^2 + (y + 2)^2 = 26$$

Center: (4, -2) radius: $\sqrt{26}$

5. A circular disk drive has a diameter with endpoints at (-9, 2) and (15, 12). Find the center and radius of the disk drive. Write the equation of the circle in standard form.

Center: (3, 7) radius: 13

$$(x - 3)^2 + (y - 7)^2 = 169$$

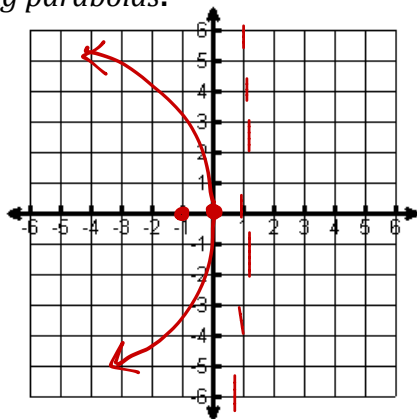
Graph the following parabolas:

6. $4x + y^2 = 0$

Direction: ↙

Focus: $(-1, 0)$

Directrix: $x = 1$

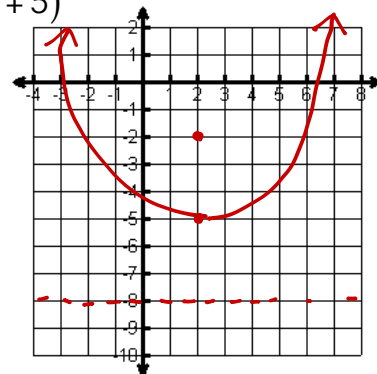


7. $(x - 2)^2 = 12(y + 5)$

Direction: ↻

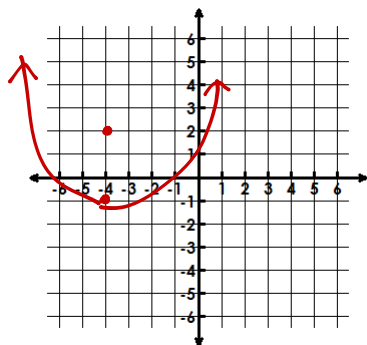
Focus: $(-2, 2)$

Directrix: $y = -8$



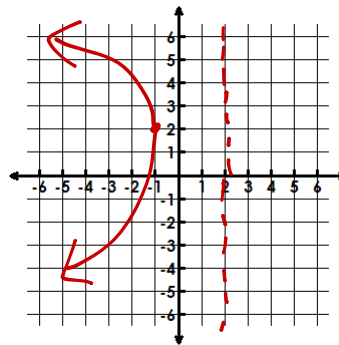
Write the equation of each parabola described below:

8. Vertex: $(-4, -1)$ and Focus: $(-4, 2)$



$y = \frac{1}{12}(x+4)^2 - 1$

9. Directrix is $x = 2$ and Vertex: $(-1, 2)$



$x = -\frac{1}{12}(y-2)^2 - 1$

Find the intersection of the two equations:

10. Algebraically: $x^2 + y^2 = 34$
 $y = x + 2$

Intersection(s): $(-5, -3)$ $(3, 5)$

11. Graphically: $(x - 4)^2 + (y + 1)^2 = 16$
 $y = x - 1$

Intersection(s): $(0, -1)$ $(4, -3)$

12. Circle C has a center of (3, 4) and a radius of 5. Does the point (0, 9) lie on circle C? Show your evidence (work).

No!

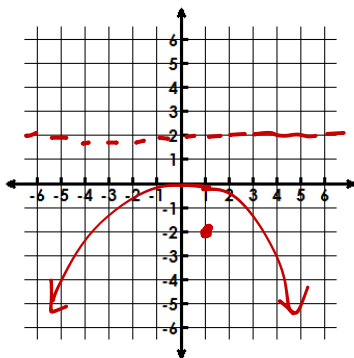
$$(x-3)^2 + (y-4)^2 = 25$$

$$x=0, y=9$$

$$(0-3)^2 + (9-4)^2 = 25$$

$$34 \neq 25 \quad \times$$

13. A parabola has its focus at (1, -2) and its directrix at $y = 2$. Does the point (5, -2) lie on the parabola? Show your evidence (work).



Yes!

$$y = -\frac{1}{8}(x-1)^2$$

$$x=5, y=-2$$

$$-2 = -\frac{1}{8}(5-1)^2$$

$$-2 = -2 \quad \checkmark$$

14. Write the equation of the circle centered at (-4, 6) with a diameter of 16.

$$(x+4)^2 + (y-6)^2 = 64$$

15. Point C is the midpoint between A and B. If point C is at (-4, 10) and point A is (4, 8), what is the point B?

$$B(-12, 12)$$

16. A circular skylight has a diameter with endpoints at (-8, 32) and (16, 28). Find the center and radius of the skylight.

$$\text{center } (-3.2, 30) \quad \text{radius: } 11.4$$

17. Find the intersection of the circle with a center at the origin and radius of 10, and a line with a slope of 1 and y-intercept of -2.

$$(-6, 8) \text{ and } (8, 6)$$

18. Put $x^2 + y^2 - 6x - 2y + 1 = 0$ of the circle in standard form.

$$(x-3)^2 + (y-1)^2 = 9$$

Review Unit 4 Conics (Page 4)

19. Find the vertex for the parabola with equation $2x + y^2 + 8y + 14 = 0$.

Vertex: $(1, -4)$

20 Circle C has a center of $(5, 2)$ and a radius of 6. Does the point $(8, 7)$ lie on circle?

No! $(x-5)^2 + (y-2)^2 = 36$ $x=8, y=7$
 $(8-5)^2 + (7-2)^2 = 36$
 $34 \neq 36 \times$

21. A parabola has its focus at $(5, 1)$ and its directrix at $x = 1$. Does the point $(5, 5)$ lie on the parabola?

Yes! $x = \frac{1}{8}(y-1)^2 + 3$ $x=5, y=5$
 $5 = \frac{1}{8}(5-1)^2 + 3$
 $5 = 5 \checkmark$

22. Use the distance formula and slope formula to determine the type of quadrilateral formed by $A(2, 3)$, $B(5, 4)$, $C(6, 1)$ and $D(3, 0)$.

Square because each side length are the same (using distance formula) & the angles are all 90° (using slope formula — opposite sign reciprocal slopes).