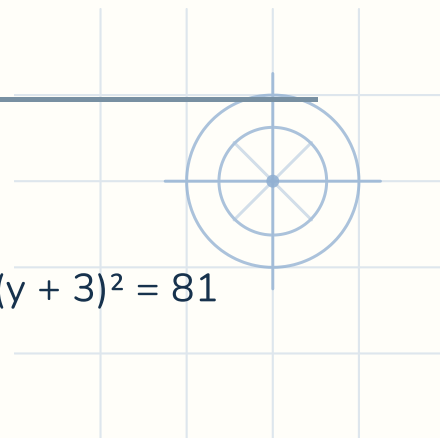


The equation of a circle — From the standard form

Name: _____

Date: _____

Write the center and radius of each circle.



1 $(x + 2)^2 + (y + 4)^2 = 9$
center $(-2, -4)$ $r = 3$

2 $(x - 6)^2 + (y + 3)^2 = 81$

3 $(x + 5)^2 + (y + 3)^2 = 81$

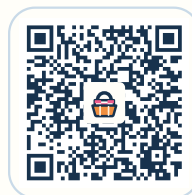
4 $(x + 4)^2 + y^2 = 4$

5 $x^2 + (y - 4)^2 = 81$

6 $(x - 2)^2 + (y - 4)^2 = 81$

7 $x^2 + (y + 2)^2 = 36$

8 $(x - 6)^2 + y^2 = 9$

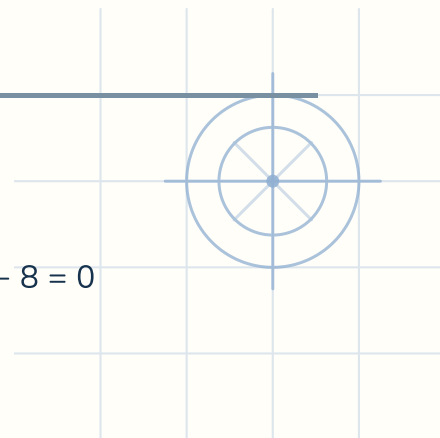


The equation of a circle — By completing the square

Name: _____

Date: _____

Complete the square to find the center and radius of each circle.



1 $x^2 + y^2 - 4x - 96 = 0$

$$(x^2 - 4x) + y^2 = 96$$

$$(x^2 - 4x + 4) + y^2 = 100$$

$$(x - 2)^2 + y^2 = 100$$

$$\text{center } (2, 0) \text{ } r = 10$$

2 $x^2 + y^2 - 2x - 8 = 0$

3 $x^2 + y^2 - 6x = 0$

4 $x^2 + y^2 + 2x - 80 = 0$

5 $x^2 + y^2 - 10x - 6y + 25 = 0$

6 $x^2 + y^2 - 12x - 2y - 12 = 0$

7 $x^2 + y^2 - 10x + 8y + 25 = 0$

8 $x^2 + y^2 + 2x - 10y + = 0$



The equation of a parabola — From the focus and directrix

Name: _____

Date: _____

Write the equation of each parabola from its focus and directrix.

1 focus $(-1, 5)$ directrix $y = -1$

$$\text{vertex} = (-1, 2)$$

$$p = 5 - 2 = 3$$

$$(x + 1)^2 = 12(y - 2)$$

2 focus $(2, -3)$ directrix $y = 3$

3 focus $(2, 5)$ directrix $y = 3$

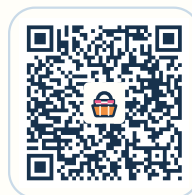
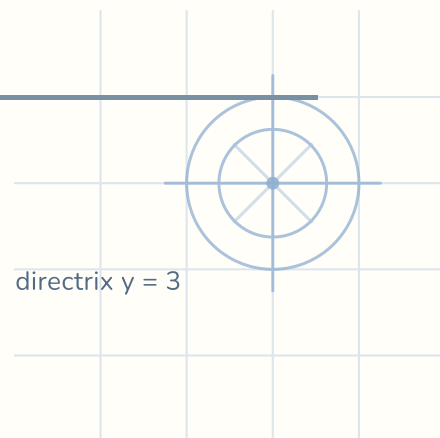
4 focus $(4, 0)$ directrix $y = -8$

5 focus $(-1, -6)$ directrix $y = 2$

6 focus $(-2, -5)$ directrix $y = -3$

7 focus $(-4, -1)$ directrix $y = -3$

8 focus $(1, 1)$ directrix $y = 5$



The equation of a parabola — Back to the focus and directrix

Name: _____

Date: _____

Find the focus and the directrix of each parabola.

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

vertex = $(-2, 3)$

$4p = -4 \rightarrow p = -1$

focus $(-2, 2) \cdot y = 4$

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

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

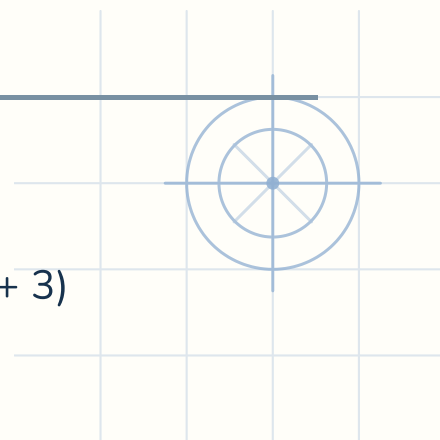
4 $(x - 4)^2 = 8(y - 4)$

5 $(x - 2)^2 = 12(y + 4)$

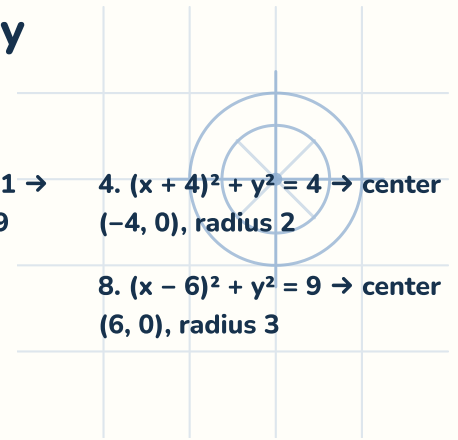
6 $(x + 4)^2 = -8(y - 2)$

7 $x^2 = -4(y - 3)$

8 $(x - 4)^2 = -12(y - 3)$



Power Pack · Circles and parabolas — Answer key



Circles in standard form

- | | | | |
|--|--|---|---|
| 1. $(x + 2)^2 + (y + 4)^2 = 9 \rightarrow$
center $(-2, -4)$, radius 3 | 2. $(x - 6)^2 + (y + 3)^2 = 81 \rightarrow$
center $(6, -3)$, radius 9 | 3. $(x + 5)^2 + (y + 3)^2 = 81 \rightarrow$
center $(-5, -3)$, radius 9 | 4. $(x + 4)^2 + y^2 = 4 \rightarrow$ center
$(-4, 0)$, radius 2 |
| 5. $x^2 + (y - 4)^2 = 81 \rightarrow$
center $(0, 4)$, radius 9 | 6. $(x - 2)^2 + (y - 4)^2 = 81 \rightarrow$
center $(2, 4)$, radius 9 | 7. $x^2 + (y + 2)^2 = 36 \rightarrow$
center $(0, -2)$, radius 6 | 8. $(x - 6)^2 + y^2 = 9 \rightarrow$ center
$(6, 0)$, radius 3 |

Circles in general form

- | | | | |
|---|---|--|--|
| 1. $x^2 + y^2 - 4x - 96 = 0 \rightarrow$
center $(2, 0)$, radius 10 | 2. $x^2 + y^2 - 2x - 8 = 0 \rightarrow$
center $(1, 0)$, radius 3 | 3. $x^2 + y^2 - 6x = 0 \rightarrow$ center
$(3, 0)$, radius 3 | 4. $x^2 + y^2 + 2x - 80 = 0 \rightarrow$
center $(-1, 0)$, radius 9 |
| 5. $x^2 + y^2 - 10x - 6y + 25 = 0 \rightarrow$ center $(5, 3)$, radius 3 | 6. $x^2 + y^2 - 12x - 2y - 12 = 0 \rightarrow$ center $(6, 1)$, radius 7 | 7. $x^2 + y^2 - 10x + 8y + 25 = 0 \rightarrow$ center $(5, -4)$, radius 4 | 8. $x^2 + y^2 + 2x - 10y + 10 = 0 \rightarrow$ center $(-1, 5)$, radius 5 |

Write the parabola

- | | | | |
|--|--|---|--|
| 1. focus $(-1, 5)$, $y = -1 \rightarrow (x + 1)^2 = 12(y - 2)$ | 2. focus $(2, -3)$, $y = 3 \rightarrow (x - 2)^2 = -12y$ | 3. focus $(2, 5)$, $y = 3 \rightarrow (x - 2)^2 = 4(y - 4)$ | 4. focus $(4, 0)$, $y = -8 \rightarrow (x - 4)^2 = 16(y + 4)$ |
| 5. focus $(-1, -6)$, $y = 2 \rightarrow (x + 1)^2 = -16(y + 2)$ | 6. focus $(-2, -5)$, $y = -3 \rightarrow (x + 2)^2 = -4(y + 4)$ | 7. focus $(-4, -1)$, $y = -3 \rightarrow (x + 4)^2 = 4(y + 2)$ | 8. focus $(1, 1)$, $y = 5 \rightarrow (x - 1)^2 = -8(y - 3)$ |

Read the focus and directrix

- | | | | |
|--|---|--|---|
| 1. $(x + 2)^2 = -4(y - 3) \rightarrow$
focus $(-2, 2)$, directrix $y = 4$ | 2. $x^2 = 16(y + 3) \rightarrow$ focus $(0, 1)$, directrix $y = -7$ | 3. $(x + 3)^2 = 8(y - 4) \rightarrow$
focus $(-3, 6)$, directrix $y = 2$ | 4. $(x - 4)^2 = 8(y - 4) \rightarrow$
focus $(4, 6)$, directrix $y = 2$ |
| 5. $(x - 2)^2 = 12(y + 4) \rightarrow$
focus $(2, -1)$, directrix $y = -7$ | 6. $(x + 4)^2 = -8(y - 2) \rightarrow$
focus $(-4, 0)$, directrix $y = 4$ | 7. $x^2 = -4(y - 3) \rightarrow$ focus $(0, 2)$, directrix $y = 4$ | 8. $(x - 4)^2 = -12(y - 3) \rightarrow$
focus $(4, 0)$, directrix $y = 6$ |