

Find the distance between each pair of points with the given coordinates. (Lesson 10-1)

1. $(9, 5), (4, -7)$ 2. $(0, -5), (10, -3)$

The coordinates of the endpoints of a segment are given. Find the coordinates of the midpoint of each segment. (Lesson 10-1)

3. $(1, 5), (-4, -3)$ 4. $(-3, 8), (-11, -6)$

DISTANCE For Exercises 5 and 6, use the following information. (Lesson 10-1)

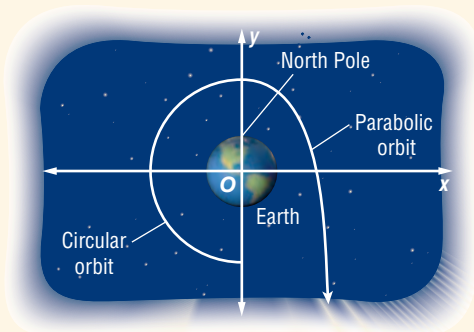
Jessica lives at the corner of 5th Avenue and 12th street. Julie lives at the corner of 15th Avenue and 4th street.

- How many blocks apart do the two girls live?
- If they want to meet for lunch halfway between their houses, where would they meet?

Write each equation in standard form. Identify the vertex, axis of symmetry, and direction of opening of the parabola. (Lesson 10-2)

- $y = x^2 - 6x + 4$
- $x = y^2 + 2y - 3$

9. **SPACE SCIENCE** A spacecraft is in a circular orbit 93 miles above Earth. Once it attains the velocity needed to escape Earth's gravity, the spacecraft will follow a parabolic path with the center of Earth as the focus. Suppose the spacecraft reaches escape velocity above the North Pole. Write an equation to model the parabolic path of the spacecraft, assuming that the center of Earth is at the origin and the radius of Earth is 3977 miles. (Lesson 10-2)



Identify the coordinates of the vertex and focus, the equation of the axis of symmetry and directrix, and the direction of opening of the parabola with the given equation. Then find the length of the latus rectum and graph the parabola. (Lesson 10-2)

10. $y^2 = 6x$

11. $y = x^2 + 8x + 20$

12. Find the center and radius of the circle with equation $x^2 + (y - 4)^2 = 49$. Then graph the circle. (Lesson 10-3)

13. **SPRINKLERS** A sprinkler waters a circular section of lawn about 20 feet in diameter. The homeowner decides that placing the sprinkler at $(7, 5)$ will maximize the area of grass being watered. Write an equation to represent the boundary the sprinkler waters. (Lesson 10-3)

14. Write an equation for the circle that has center at $(-1, 0)$ and passes through $(2, -6)$. (Lesson 10-4)

15. **MULTIPLE CHOICE** What is the radius of the circle with equation $x^2 + y^2 + 8x + 8y + 28 = 0$? (Lesson 10-3)

- A 2
B 4
C 8
D 28

16. Write an equation of the ellipse with foci at $(3, 8)$ and $(3, -6)$ and endpoints of the major axis at $(3, -8)$ and $(3, 10)$. (Lesson 10-4)

Find the coordinates of the center and foci and the lengths of the major and minor axes of the ellipse with the given equation. Then graph the ellipse. (Lesson 10-4)

17. $\frac{(x - 4)^2}{9} + \frac{(y + 2)^2}{1} = 1$

18. $16x^2 + 5y^2 + 32x - 10y - 59 = 0$