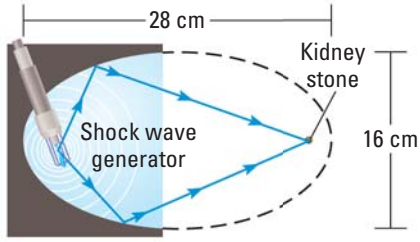
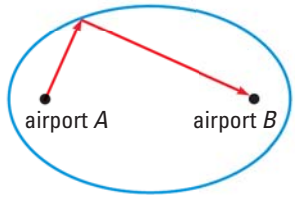
50. HEALTH CARE A *lithotripter* uses shock waves to break apart kidney stones or gallstones inside the body. Shock waves generated at one focus of an *ellipsoid* (a three-dimensional shape with an elliptical cross section) reflect to the stone positioned at the second focus. Write an equation for the cross section of the ellipsoid with the dimensions shown. How far apart are the foci?



51. TAKS REASONING Halley's comet ranges from 0.59 to 35.3 astronomical units from the sun, which is at one focus of the comet's elliptical orbit. (An *astronomical unit* is Earth's mean distance from the sun.) *Explain* using a sketch how to find a and c. Then write an equation for the orbit.

52. TAKS REASONING A small airplane with enough fuel to fly 600 miles safely will take off from airport A and land at airport B, 450 miles away.



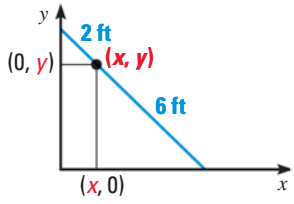
a. Reason The region in which the airplane can fly is bounded by an ellipse. *Explain* why this is so.

b. Calculate Let (0, 0) represent the center of the ellipse. Find the coordinates of each airport.

c. Apply Suppose the plane flies from airport A straight past airport B to a vertex of the ellipse and then straight back to airport B. How far does the plane fly? Use your answer to find the coordinates of the vertex.

d. Model Write an equation of the ellipse.

53. CHALLENGE An art museum worker leaves an 8-foot-tall painting leaning against a wall. Later, the top of the painting slides down the wall, and the painting falls to the floor. Use the diagram to find an equation of the path of the point (x, y) as the painting falls.

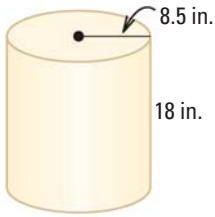


MIXED REVIEW FOR TAKS

TAKS PRACTICE at classzone.com

REVIEW
TAKS Preparation p. 66; TAKS Workbook

54. TAKS PRACTICE Iris wants to make candles shaped like rectangular prisms that measure 3 inches long, 2 inches wide, and 5 inches high. To make the candles, she melts the cylindrical block of wax shown. How many candles can she make? *TAKS Obj. 10*



Ⓐ 113 Ⓑ 126
Ⓒ 136 Ⓓ 288

REVIEW
Lesson 5.1; TAKS Workbook

55. TAKS PRACTICE The area of a triangle is $45m^7n^{13}$ square units and its height is $15m^{10}n^9$ units. What is the length of the triangle's base? *TAKS Obj. 5*

Ⓕ $\frac{3m^3}{n^4}$ units Ⓖ $\frac{6n^4}{m^3}$ units
Ⓗ $3m^3n^4$ units Ⓙ $6m^{17}n^{22}$ units