51. **TAKS REASONING** You are in a park surfing the Internet on a wireless connection. A hotel's wireless transmitter is located 100 yards east and 60 yards south of you. It has a range of 150 yards. A café's transmitter is located 80 yards west and 70 yards south of you. It has a range of 100 yards.

a. With your location as the origin, write inequalities for circular regions around the hotel and café in which you can get wireless Internet access.

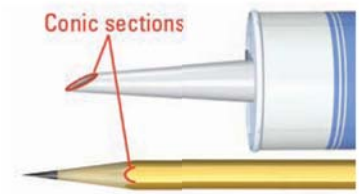
b. Graph the inequalities. Are you in only one region or in both? *Explain*.

c. *Explain* how to determine whether the regions overlap without graphing.

52. **TAKS REASONING** Tell what conic section is formed in the situation described. *Explain* your reasoning.

a. To use a new tube of caulk for the first time, you cut the cone-shaped tip diagonally as shown.

b. When you sharpen a pencil with flat sides, each side intersects the cone-shaped tip as shown.



53. **CHALLENGE** A *degenerate* conic results when the intersection of a plane with a double-napped cone is not a parabola, circle, ellipse, or hyperbola.

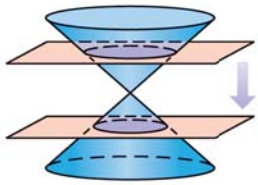


Diagram 1

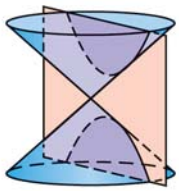


Diagram 2

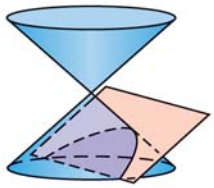


Diagram 3

a. In Diagram 1, a plane perpendicular to the cone's axis passes through the cone, intersecting it in a circle whose radius decreases and then increases. When is the intersection not a circle? What is it?

b. In Diagram 2, a plane parallel to the cone's axis passes through the cone, intersecting it in a hyperbola whose vertices get closer together and then farther apart. When is the intersection not a hyperbola? What is it?

c. In Diagram 3, a plane parallel to the cone's nappe passes through the cone, intersecting it in a parabola that first gets narrower, then flips and gets wider. When is the intersection not a parabola? What is it?

MIXED REVIEW FOR TAKS

TAKS PRACTICE at classzone.com

REVIEW Lesson 1.5; TAKS Workbook

54. **TAKS PRACTICE** In 2003, the population of Texas was about 39,000 less than 3 times the population of Virginia. Let x represent the population of Virginia. Which expression represents the population of Texas? *TAKS Obj. 1*

Ⓐ $39{,}000 - 3x$

Ⓑ $\dfrac{x - 39{,}000}{3}$

Ⓒ $\dfrac{x}{3} - 39{,}000$

Ⓓ $3x - 39{,}000$

REVIEW TAKS Preparation p. 408; TAKS Workbook

55. **TAKS PRACTICE** The measure of each interior angle of a regular polygon is 135°. How many sides does the polygon have? *TAKS Obj. 6*

Ⓕ 6 Ⓖ 7 Ⓗ 8 Ⓙ 9