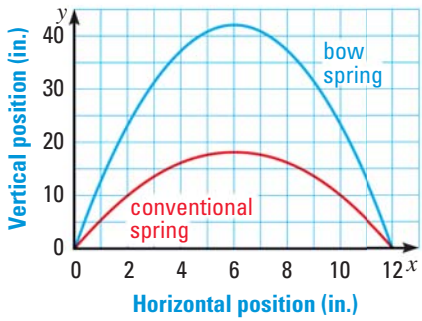
54. **TAKS REASONING** A jump on a pogo stick with a conventional spring can be modeled by $y = -0.5(x - 6)^2 + 18$, and a jump on a pogo stick with a bow spring can be modeled by $y = -1.17(x - 6)^2 + 42$, where x and y are measured in inches. *Compare* the maximum heights of the jumps on the two pogo sticks. Which constants in the functions affect the maximum heights of the jumps? Which do not?



55. **TAKS REASONING** A kernel of popcorn contains water that expands when the kernel is heated, causing it to pop. The equations below give the "popping volume" y (in cubic centimeters per gram) of popcorn with moisture content x (as a percent of the popcorn's weight).

Hot-air popping: $y = -0.761(x - 5.52)(x - 22.6)$

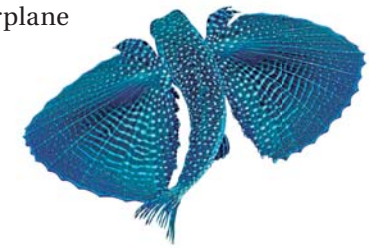
Hot-oil popping: $y = -0.652(x - 5.35)(x - 21.8)$

a. **Interpret** For hot-air popping, what moisture content maximizes popping volume? What is the maximum volume?

b. **Interpret** For hot-oil popping, what moisture content maximizes popping volume? What is the maximum volume?

c. **Graphing Calculator** Graph the functions in the same coordinate plane. What are the domain and range of each function in this situation? *Explain* how you determined the domain and range.

56. **CHALLENGE** Flying fish use their pectoral fins like airplane wings to glide through the air. Suppose a flying fish reaches a maximum height of 5 feet after flying a horizontal distance of 33 feet. Write a quadratic function $y = a(x - h)^2 + k$ that models the flight path, assuming the fish leaves the water at $(0, 0)$. *Describe* how changing the value of a, h, or k affects the flight path.



MIXED REVIEW FOR TAKS

TAKS PRACTICE at classzone.com

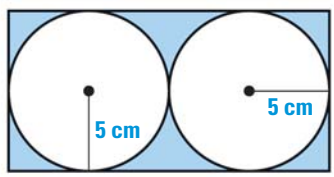
REVIEW
Lesson 1.5;
TAKS Workbook

57. **TAKS PRACTICE** A salesperson wants to analyze the time he spends driving to visit clients. In a typical week, the salesperson drives 870 miles during a period of 22 hours. His average speed is 65 miles per hour on the highway and 30 miles per hour in the city. About how many hours a week does the salesperson spend driving in the city? *TAKS Obj. 10*

Ⓐ 6 h Ⓑ 8.2 h Ⓒ 13.9 h Ⓓ 16 h

REVIEW
TAKS Preparation p. 470;
TAKS Workbook

58. **TAKS PRACTICE** What is the approximate area of the shaded region? *TAKS Obj. 8*



Ⓕ 21.5 cm^2

Ⓖ 42.9 cm^2

Ⓗ 121.4 cm^2

Ⓙ 150 cm^2