

73. **TAKS REASONING** You can model the position  $(x, y)$  of a moving object using a pair of *parametric equations*. Such equations give  $x$  and  $y$  in terms of a third variable  $t$  that represents time. For example, suppose that when a basketball player attempts a free throw, the path of the basketball can be modeled by the parametric equations

$$x = 20t$$

$$y = -16t^2 + 21t + 6$$

where  $x$  and  $y$  are measured in feet,  $t$  is measured in seconds, and the player's feet are at  $(0, 0)$ .

- a. **Evaluate** Make a table of values giving the position  $(x, y)$  of the basketball after 0, 0.25, 0.5, 0.75, and 1 second.
- b. **Graph** Use your table from part (a) to graph the parametric equations.
- c. **Solve** The position of the basketball rim is  $(15, 10)$ . The top of the backboard is  $(15, 12)$ . Does the player make the free throw? *Explain.*
74. **CHALLENGE** The Stratosphere Tower in Las Vegas is 921 feet tall and has a "needle" at its top that extends even higher into the air. A thrill ride called the Big Shot catapults riders 160 feet up the needle and then lets them fall back to the launching pad.
- a. The height  $h$  (in feet) of a rider on the Big Shot can be modeled by  $h = -16t^2 + v_0t + 921$  where  $t$  is the elapsed time (in seconds) after launch and  $v_0$  is the initial vertical velocity (in feet per second). Find  $v_0$  using the fact that the maximum value of  $h$  is  $921 + 160 = 1081$  feet.
- b. A brochure for the Big Shot states that the ride up the needle takes two seconds. *Compare* this time with the time given by the model  $h = -16t^2 + v_0t + 921$  where  $v_0$  is the value you found in part (a). Discuss the model's accuracy.



## MIXED REVIEW FOR TAKS

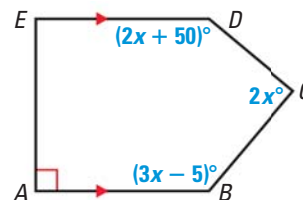
**TAKS PRACTICE** at classzone.com

### REVIEW

TAKS Preparation  
p. 408;  
TAKS Workbook

75. **TAKS PRACTICE** In the figure shown,  $\overline{AB}$  is parallel to  $\overline{ED}$ . Which equation can be used to find the value of  $x$ ? **TAKS Obj. 6**

- (A)  $5x + 225 = 360$       (B)  $5x + 235 = 540$   
(C)  $7x + 235 = 360$       (D)  $7x + 225 = 540$



### REVIEW

Lesson 3.2;  
TAKS Workbook

76. **TAKS PRACTICE** Music recital tickets are \$4 for students and \$6 for adults. A total of 725 tickets are sold and \$3650 is collected. Which pair of equations can be used to determine the number of students,  $s$ , and the number of adults,  $a$ , who attended the music recital? **TAKS Obj. 4**

- (F)  $s + a = 725$   
 $4s + 6a = 3650$
- (G)  $s + a = 725$   
 $6s + 4a = 3650$
- (H)  $s - a = 725$   
 $4s - 6a = 3650$
- (J)  $4s + 6a = 725$   
 $s + a = 3650$