

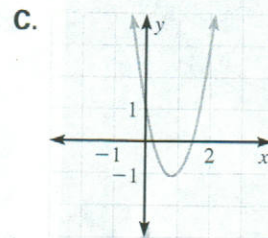
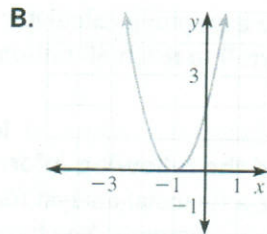
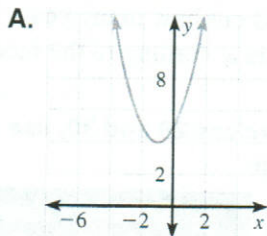
**FIELD TARGET EVENT** In Exercises 71–76, six balloonists compete in the Field Target Event at a hot-air balloon festival. Calculate the amount of time it takes for the marker to hit the target when thrown down from the given initial height (in feet) with the given initial velocity (in feet per second).

71.  $s = 200$ ;  $v = -50$       72.  $s = 150$ ;  $v = -25$       73.  $s = 100$ ;  $v = -10$   
 74.  $s = 150$ ;  $v = -33$       75.  $s = 80$ ;  $v = -40$       76.  $s = 50$ ;  $v = 0$

**VERTICAL MOTION** In Exercises 77–80, use a vertical motion model to find how long it will take for the object to reach the ground.

77. You drop keys from a window 30 feet above ground to your friend below. Your friend does not catch them.  
 78. An acorn falls 45 feet from the top of a tree.  
 79. A lacrosse player throws a ball upward from her playing stick with an initial height of 7 feet, at an initial speed of 90 feet per second.  
 80. You throw a ball downward with an initial speed of 10 feet per second out of a window to a friend 20 feet below. Your friend does not catch the ball.

**NUMBER OF X-INTERCEPTS** Use the related equation to find the number of x-intercepts the graph of the function has. Then match the function with its graph.



15.  $y = 2x^2 + 4x + 2$       16.  $y = 3x^2 - 5x + 1$       17.  $y = x^2 + 2x + 5$

**INTERPRETING THE DISCRIMINANT** Consider the equation  $\frac{1}{2}x^2 + \frac{2}{3}x - 3 = 0$ .

18. Evaluate the discriminant.  
 19. How many solutions does the equation have?  
 20. What does the discriminant tell you about the graph of  $y = \frac{1}{2}x^2 + \frac{2}{3}x - 3$ ? Does the graph cross the x-axis?

**BASKETBALL** In Exercises 25 and 26, use the vertical motion model  $h = -16t^2 + vt + s$  (p. 535) and the following information.

You and a friend are playing basketball. You can jump with an initial velocity of 12 feet per second. You need to jump 2.2 feet to dunk a basketball. Your friend can jump with an initial velocity of 14 feet per second. Your friend needs to jump 3.4 feet to dunk a basketball.

25. Can you dunk the ball? Can your friend? Justify your answers.  
 26. Suppose you can jump with an initial velocity of 11.5 feet per second and your friend can jump with an initial velocity of 15.5 feet per second. How, if at all, would this change your answers to Exercise 25?