

# 4.3 Review - Warm - up

$y = ax^2 + bx + c$     $a = ?$     $b = ?$     $c = ?$

1. Write in standard form the equation of the parabola that contains the points (0, 0), (-2, -6), and (3, -3).

$(0, 0)$   
 $0 = a(0)^2 + b(0) + c$   
 $0 = c$  ✓

$(-2, -6)$   
 $-6 = a(-2)^2 + b(-2) + c$   
 $-6 = 4a - 2b$

$(3, -3)$   
 $-3 = a(3)^2 + b(3) + c$   
 $-3 = 9a + 3b$

$3(-6 = 4a - 2b) \rightarrow -18 = 12a - 6b$   
 $2(-3 = 9a + 3b) \rightarrow -6 = 18a + 6b$   


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 $\frac{-24}{30} = \frac{30a}{30}$     $a = -8$  ✓

$-6 = 18(-8) + 6b$   
 $-6 = -14.4 + 6b$   
 $+14.4 \quad +14.4$   


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 $8.4 = 6b$

$\frac{8.4}{6} = \frac{6b}{6}$   
 $1.4 = b$  ✓

$y = -8x^2 + 1.4x$

2. Billy is playing t-ball and it's his turn to hit the ball. The ball is on the tee at a height of 5 feet. Billy is really strong and hits the ball upward with a velocity of 45 ft/sec. How long does it take the ball to reach its maximum height? What is the actual height of the ball at the max height? ( $h = -16t^2 + v_0t + h_0$ ) (Round to the nearest hundredth.)

$h = -16t^2 + 45t + 5$

$t = \frac{-b}{2a} = \frac{-(45)}{2(-16)} = \frac{-45}{-32} = 1.41 \text{ sec}$

$h = -16(1.41)^2 + 45(1.41) + 5$   
 $h = 36.64 \text{ ft.}$

