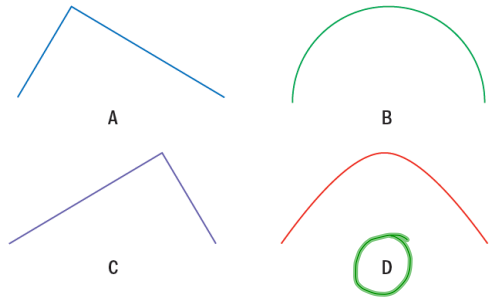
Notes 6.4

Slip and Slide!!

Which most resembles his flight path?



Projectile Motion

height, gravity, initial velocity, initial height

$$h = -\frac{1}{2}gt^2 + v_0t + h_0$$

time

gravity: 9.8 $\frac{\text{meters}}{\text{second}^2}$

32 $\frac{\text{feet}}{\text{second}^2}$

Ex. 2

Suppose a ball is thrown upward from a height of 10 feet with an initial velocity of 44 ft/sec. Write an equation relating the time t and the height h of the ball.

$h = -\frac{1}{2}(32)t^2 + 44t + 10$

$h = -16t^2 + 44t + 10$

Use the graph to estimate what time(s) the height of the ball is 20 ft.

.25 sec. & 2.5 sec.

Use that formula to determine the height of the ball one-half second after it was thrown. 28 ft

Ex. 3

Suppose a toy rocket is launched so that its height h in meters after t seconds is given by $h = -4.9t^2 + 20t + 1.5$.

a. How high is the rocket after one second?

16.6 meters

b. How high is the rocket when launched?

t=0 1.5

c. How high is the rocket after 12 seconds?

0 (already hit ground)

d. When is the rocket 15 feet high?

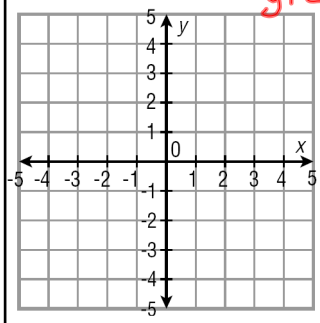
.85 sec & 3.2 sec.

Ex. 4

Graph $y = x^2 + 2x - 1$. Use the graph to write the equation in vertex form.

(-1, -2)

$y+2 = (x+1)^2$



Ex. 1

Are these two equations equivalent?

$y + 4 = 3(x + 1)^2$ $\quad$ $y = 3x^2 + 6x - 1$

$-4 \qquad -4$

$y = 3(x+1)^2 - 4$

yes

Write in Standard Form

$$y + 6 = (x - 3)^2$$

$y+6 = (x-3)(x-3)$

$y+6 = x^2 - 3x - 3x + 9$

$-6 \qquad\qquad -6$

$y = x^2 - 6x + 3$