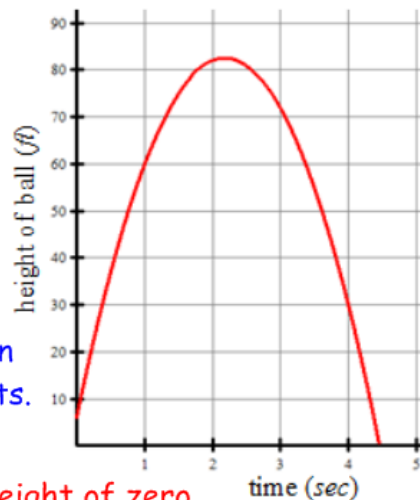


Use the information to fill the table exactly and answer the questions.

1. A six foot tall man throws a baseball straight up into the air. The equation represents the ball's height over time.

$$h = -16t^2 + 70t + 6$$

time (sec)	height of ball (ft)
1	60 ← $-16(1)^2 + 70(1) + 6$
2	82 ← $-16(2)^2 + 70(2) + 6$
3	72 ← $-16(3)^2 + 70(3) + 6$
4	30 ← $-16(4)^2 + 70(4) + 6$



The ball is 6 feet high when the timer starts.

- a) Find the y-intercept. What does it represent?
 (0,6) At time zero, the ball is six feet high
- b) Approximate the x-intercept. What does it represent?

≈ 4.4 seconds At approximately 4.4 seconds the ball has a height of zero
 The ball lands on the ground after being in the air approximately 4.4 seconds.

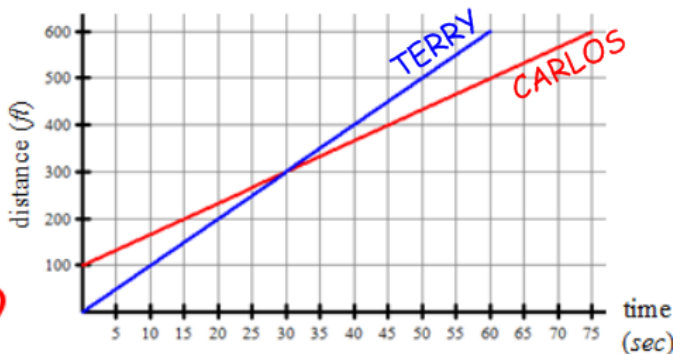
Use the story and graph to write an equation and fill in the table for each. Answer the questions.

2. Carlos and Terry run a race. Terry runs 10 ft/sec. Carlos gets a 100 foot head start and runs 20 feet every 3 sec.

CARLOS
 $d = \frac{20}{3}t + 100$

time (sec)	distance (ft)
15	200
45	400
21	240

$d = \frac{20}{3}(21) + 100$



TERRY
 $d = 10t$

time (sec)	distance (ft)
10	100
50	500
8.5	85

$d = 10(8.5)$

- a) Label each line above as Carlos or Terry. Explain how you know which is which.

Carlos starts at 100 feet so his y-intercept is 100, at 15 seconds he is 200 feet so must hit (15,200)
 Terry starts at zero so his y-intercept is zero, at 10 seconds he is 100 feet so must hit (10,100)

- b) Find the point of intersection. What does it represent?

(30,300) At 30 seconds both Carlos and Terry have a distance of 300 feet. They are tied!

- c) What is the distance of the race? Who won?

The race is 600 feet. Terry won by 100 feet. This is because Terry finished the 600 foot race in 60 seconds. At this time Carlos was 500 feet so the difference is $600 - 500 = 100$ feet.

- d) Who is winning at 42 seconds? How much are they winning by?

Using the equations to find exact times...

CARLOS
 $d = \frac{20}{3}(42) + 100$

$d = 380$ feet

TERRY
 $d = 10(42)$

$d = 420$ feet

Terry is winning by 40 feet.
 $420 - 380 = 40$ feet

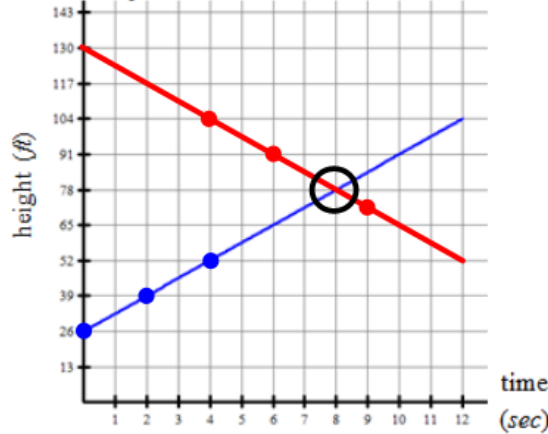
Use the equations and graphs that model the situation to answer the questions.

3. Anthony and Mari are in two different elevators in a large building. Each floor is 13 feet tall. Mari's height over time is graphed below. Both Anthony and Mari ride their elevator for 12 seconds.

ANTHONY

$$h = 130 - \frac{13}{2}t$$

time (sec)	height (feet)
4	104
6	91
9	71.5



MARI

$$h = 26 + \frac{13}{2}t$$

time (sec)	height (feet)
0	26
2	39
4	52

SMP #4

- a) Graph Anthony's equation on the graph above. *shown in red above*

- b) Find the y-intercept for Anthony and Mari. What do the y-intercepts represent in this situation?

(0,130) At time zero Anthony is 130 feet in the air. He starts 130 feet in the air.

(0,26) At time zero Mari is 26 feet in the air. She starts 26 feet in the air.

- c) At what time will Anthony and Mari pass each other? Circle this point on the graph above.

The point of intersection is (8,78) and is circle above. They are passing each other at 8 seconds.

- d) What floor does Anthony stop on after 12 seconds?

At 12 seconds Anthony is 52 feet in the air. Each floor is 13 feet so $52 \div 13 = 4^{\text{th}}$ floor.

Use the equation to complete the table and sketch a graph.

4. $y = 2x^2 + 3x - 7$

x	y
-3	2
-2	-5
-1	-8
0	-7
1	-2
2	7
3	20

Handwritten work for the table:

$$2(-3)^2 + 3(-3) - 7$$

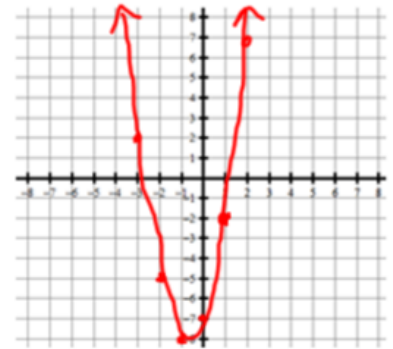
$$2 \cdot 9 - 9 - 7$$

$$18 - 9 - 7$$

$$9 - 7$$

$$2$$

NOTE: This point does not fit on the graph paper!



5. $y = -x^2 - 6x - 6$

x	y
-6	-6
-5	-1
-4	2
-3	3
-2	2
-1	-1
0	-6

Handwritten work for the table:

$$-(-6)^2 - 6(-6) - 6$$

$$-36 + 36 - 6$$

$$0 - 6$$

$$-6$$

