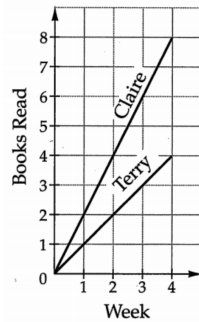


# DO NOW

The graph represents the number of books read by Claire and Terry over a 4 week period. Who reads faster, and by how much?

- Claire reads 8 more books per week than Terry.
- Claire reads 2 more books per week than Terry.
- Claire reads 1 more book per week than Terry.
- Claire reads twice as many books per week as Terry.



## 3.8 Modeling with Linear Functions

- $x$  -  $x$ -axis is the independent variable (horizontal)  
↳ What you know first - INPUT
- $y$  -  $y$ -axis is the dependent variable (vertical)  
↳ changes depending on  $x$ -value

Tips for Reading Graphs:

- Don't rush the reading. SLOW DOWN and pay attention to details.
- Questions about rate of change  
↳ \*\*\* SLOPE
- Questions about starting conditions or beginning values → \*\*\* y-INTERCEPT
- Questions asking when the values are the same → \*\*\* INTERSECTION

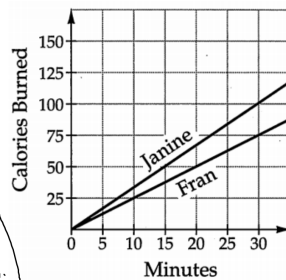
Page 1

Page 2

- Both Janine and Fran used exercise equipment at their gym. Fran walked on a treadmill and Janine rode a stationary bike. Their times and calories burned are shown in the graph below. In calories burned per hour, how much faster was Janine than Fran?

Janine  
↳ 200 calories per hour  
Fran  
↳ 150 calories per hour  
 $200 - 150 = 50$

Janine burned 50 more calories per hour than Fran.



Page 3

- Two different health clubs have the following rates. Sheila's Spa charges a flat fee of \$350 a year for the use of the club, machines, the pool and the classes. Gina's Gym charges \$150 a year for the use of the club, machines, and pool, plus \$20 per exercise class.

Let  $C$  = cost per year  
 $n$  = # of exercise classes

Sheila's Spa

$C = 350$

horizontal

Gina's Gym

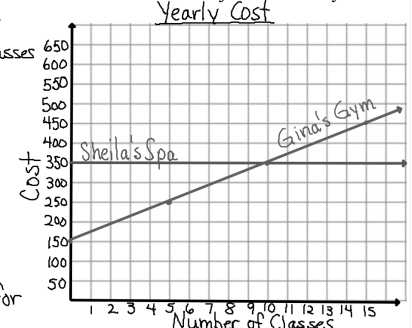
$C = 150 + 20n$

$y = mx + b$

$m = 20$

$b = 150$

C. It is more economical for less than 10 classes.



Page 4

- Get Fit Now, Witness Fitness, and Beech Tree Gym all have a constant monthly rate after the initial fee. The cost for each fitness center is found at right as either a graph, table or equation.

- Which of the three fitness centers has the lowest monthly rate? \* SLOPE
- Which fitness center would cost the least for 6 months of use?

a. Get Fit Now

$$m = \frac{20}{1} = 20$$

Witness Fitness

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = 22$$

$$m = \frac{218 - 196}{9 - 8}$$

Beech Tree Gym

$$m = 22$$

$$m = 22.5$$

Get Fit Now has the lowest monthly rate.

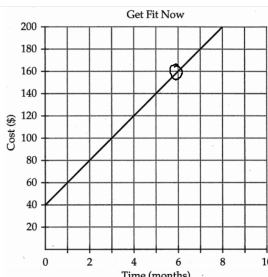
b. Get Fit Now → \$160

Witness Fitness → \$152

Beech Tree Gym → \$165

Witness Fitness costs the least for 6 months.

Beech Tree Gym:  $C = 22.5m + 30$



Witness Fitness	
Time (months)	Cost (\$)
3	86
5	130
8	196
9	218

Page 5

# HOMework

Worksheet - HW 3.8 Linear Modeling

Page 6