31 A family is traveling from their home to a vacation resort hotel. The table below shows th distance from home as a function of time.

Time (hrs)	0	2	5	7
Distance (mi)	0	140	375	480

+5

+340

Determine the average rate of change between hour 2 and hour 7, including units.

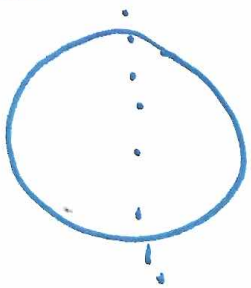
$$\frac{\Delta y}{\Delta x} = \frac{340}{5} = 68 \text{ miles per hour}$$

32 Nora says that the graph of a circle is a function because she can trace the whole graph witho picking up her pencil.

Mia says that a circle graph is *not* a function because multiple values of x map to the same y-value.

Determine if either one is correct, and justify your answer completely.

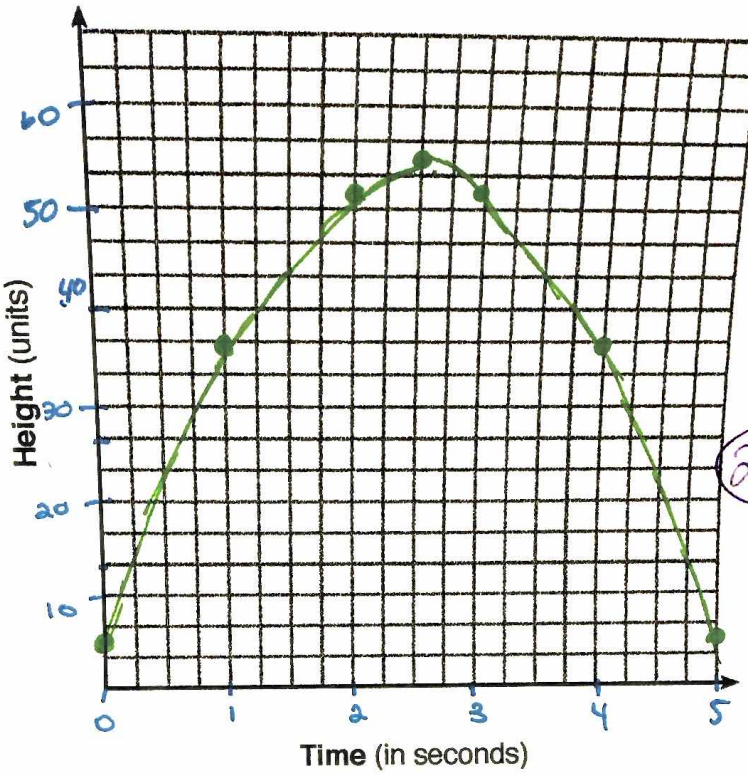
Nora is incorrect b/c a circle is not a function. It fails the vertical line test.



Mia is right that it is not a function but her definition is wrong. Every x value needs to have its own y value. In a circle x values repeat w/ different y's.

[0

36 Alex launched a ball into the air. The height of the ball can be represented by the equation $h = -8t^2 + 40t + 5$, where h is the height, in units, and t is the time, in seconds, after the ball was launched. Graph the equation from $t = 0$ to $t = 5$ seconds.



X	y
0	5
1	37
2	53
2.5	55
3	53
4	37
5	5

State the coordinates of the vertex and explain its meaning in the context of the problem.

vertex when $x = 2.5$

$h = -8(2.5)^2 + 40(2.5) + 5$

$h = 55$

the vertex is (2.5, 55) and it is the max height of the ball at 2.5 seconds.

19 The daily cost of production in a factory is calculated using $c(x) = 200 + 16x$, where x is the number of complete products manufactured. Which set of numbers best defines the domain of $c(x)$?

Use this space for computations.

(1) integers

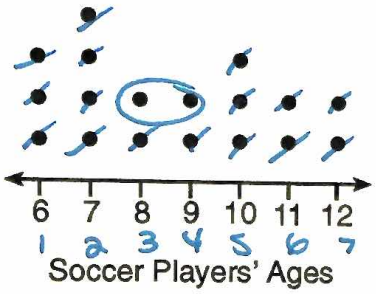
(2) positive real numbers

(3) positive rational numbers

(4) whole numbers

↳ # of products can only be 0, 1, 2, 3 . . .

* 20 Noah conducted a survey on sports participation. He created the following two dot plots to represent the number of students participating, by age, in soccer and basketball.



Soccer Players' Ages

↳ middle #

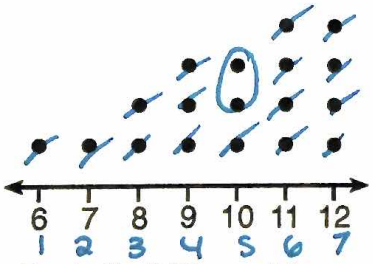
median = 8.5

mean = $\frac{156}{18} = 8.\overline{6}$

↳ Average

spread = 7

# of data points



Basketball Players' Ages

median = 10

mean = $\frac{178}{18} = 9.\overline{8}$

↳ true

Which statement about the given data sets is correct?

(1) The data for soccer players are skewed right.

(2) The data for soccer players have less spread than the data for basketball players.

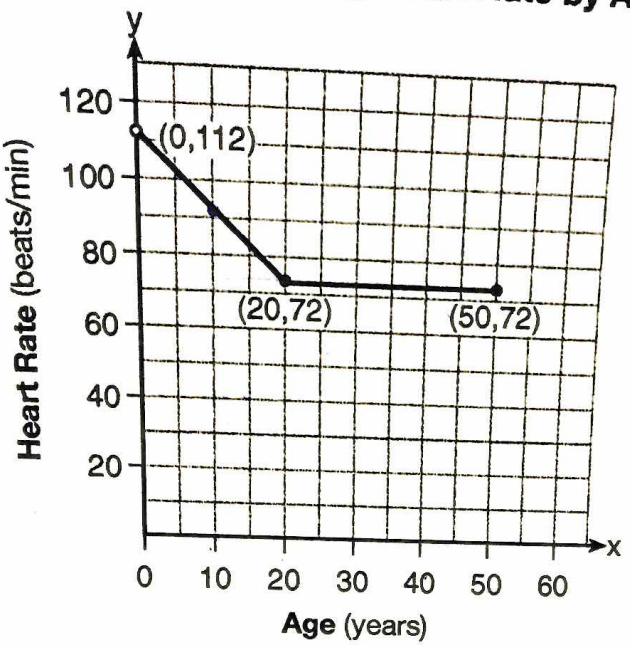
(3) The data for basketball players have the same median as the data for soccer players. NO

(4) The data for basketball players have a greater mean than the data for soccer players. YES

21 A graph of average resting heart rates is shown below. The average resting heart rate for adults is 72 beats per minute, but doctors consider resting rates from 60-100 beats per minute within normal range.

Use this space for computations.

Average Resting Heart Rate by Age



Which statement about average resting heart rates is *not* supported by the graph?

(1) A 10-year-old has the same average resting heart rate as a 20-year-old. 90 ≠ 72 False

(2) A 20-year-old has the same average resting heart rate as a 30-year-old. ✓ True - both 72

(3) A 40-year-old may have the same average resting heart rate for ten years. ✓ 40 and 50 both have 72 ✓ True

(4) The average resting heart rate for teenagers steadily decreases. ✓ True from 0 - 20 years it goes down

22 The method of completing the square was used to solve the equation $2x^2 - 12x + 6 = 0$. Which equation is a correct step when using this method?

Put into y_1

(1) $(x-3)^2 = 6$

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

(3) $(x-3)^2 = 3$

(4) $(x-3)^2 = -3$

Set all choices $= 0$

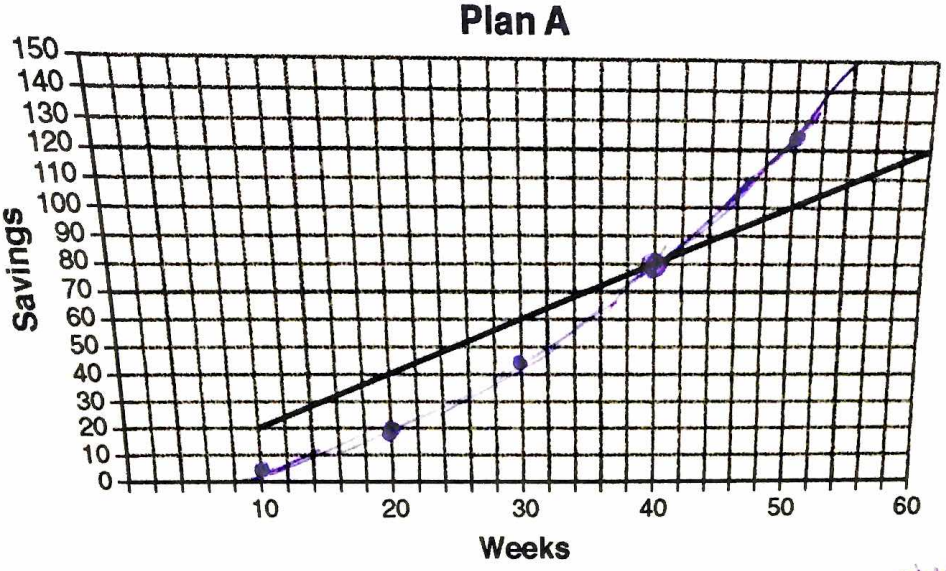
* calc trick like #1
Are the y values equal?

Put into y_2

1) $(x-3)^2 - 6 = 0$
2) $(x-3)^2 + 6 = 0$
3) $(x-3)^2 - 3 = 0$
4) $(x-3)^2 + 3 = 0$

Use this space for computations.

23 Nancy works for a company that offers two types of savings plans. Plan A is represented on the graph below.



Plan B is represented by the function $f(x) = 0.01 + 0.05x^2$, where x is the number of weeks. Nancy wants to have the highest savings possible after a year. Nancy picks Plan B.

Her decision is

(1) correct, because Plan B is an exponential function and will increase at a faster rate

(2) correct, because Plan B is a quadratic function and will increase at a faster rate

(3) incorrect, because Plan A will have a higher value after 1 year

(4) incorrect, because Plan B is a quadratic function and will increase at a slower rate

24 The 2014 winner of the Boston Marathon runs as many as 120 miles per week. During the last few weeks of his training for an event, his mileage can be modeled by $M(w) = 120(.90)^{w-1}$, where w represents the number of weeks since training began. Which statement is true about the model $M(w)$?

(1) The number of miles he runs will increase by 90% each week.

(2) The number of miles he runs will be 10% of the previous week.

(3) $M(w)$ represents the total mileage run in a given week.

(4) w represents the number of weeks left until his marathon.