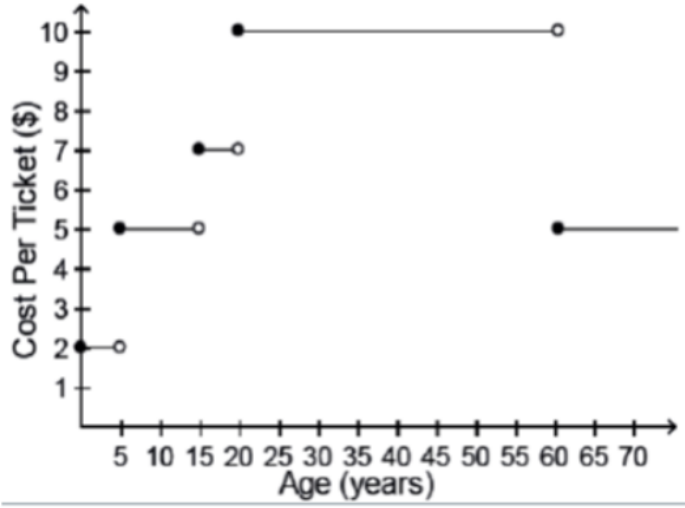
NAME: _____ **QUIZ: FUNCTIONS**

/40

1. The following graph shows the ticket prices according to a person's age for a movie theater.



7 5

Jasmine is 15 years old and is going to the movies this Friday with her 5 year old brother, her 40 year old mother, and her 60 year old grandmother.

10 5

What is the total cost of the four of them going to the movies? **(4pts)**

a) $22 b) $29 c) $27 d) $25

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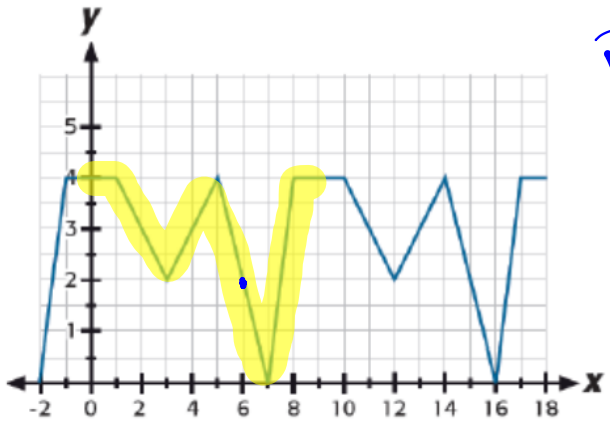
2. A periodic function is represented in the Cartesian Plan below.

Find the value of f(51). **(4pts)**



$P = 9$

$f(51 - 5(9)) = f(6) = 2$

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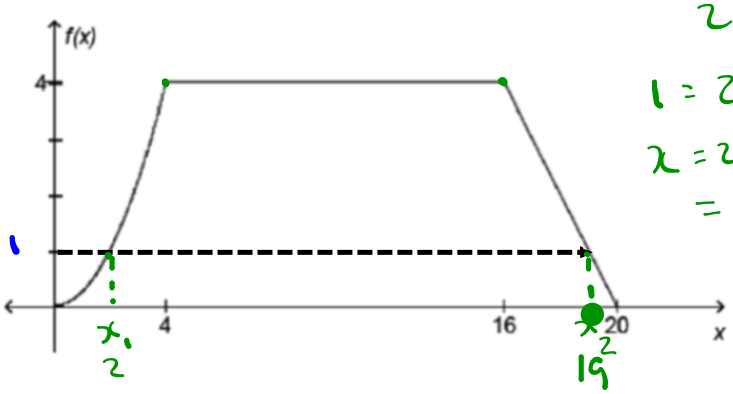
3. The share value of a company's stock price is represented in the graph below by the piecewise function

$$f(x)=\begin{cases} 0.25x^2 & 0\le x\le 4 \\ 4 & 4<x\le 16 \\ 20-x & 16<x\le 20 \end{cases}$$



For how many days was the stock price at least $1? **(4pts)**

a) 17 days b) 20 days c) 3 days d) 18 days

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4. The surface area of a beach ball can be found using a quadratic rule. Matthew works for a plastic company and is given the following information to help manufacture beach balls.

"A beach ball with a radius of 12 cm has a surface area of 1809.59 cm^2."

x = radius of a beach ball (cm)

f(x) = surface area of a beach ball (cm^2)

$y = ax^2$

$1809.59 = a(12)^2$

$a = 12.57$

Help Matthew find:

a) **The surface area of a beach ball with a radius of 15 cm.** **(2pts)**

$y = 12.57x^2$

$12.57(15)^2 = 2828.25$

b) **The radius of a beach ball that has a surface area of 804.25 cm^2.** **(2pts)**

$y = 12.57x^2$

$804.25 = 12.57x^2$

$8 = x$

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5. Cindy has 2 companies she has invested with. She initially invested $100 in Company A and $90 in Company B.

Company A calculates her investment using the following rule:

$$f(x) = 100(1.06)^x$$

Her investment with Company B grows at a rate of 7% per year with respect to the previous year where:

x = years since initial investment

f(x) = value of investment.

for both companies.

What is the value of the investment made with Company B when the value of the investment in Company A is $159.38? **(4pts)**

A: $159.38 = 100(1.06)^x$

$x = 8$

B: S:

K

T

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6. The piecewise function calculates the salary of an employee who works on commission at a local BMW dealership.

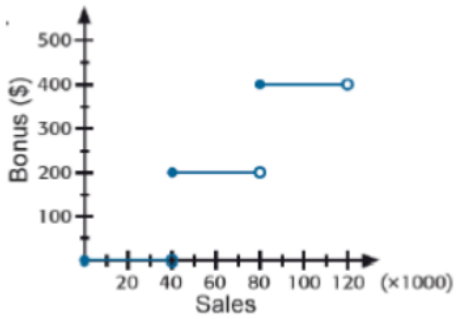
x = amount of sales per week in dollars

f(x) = salary per week

The salary scale changes depending on the amount of sales,

$$f(x)=\begin{cases}400 & 0\le x<50000\\ 0.0055x+125 & 50000\le x<120000\\ 0.006x+150 & x\ge 120000\end{cases}$$

The step function shows the bonus received by an employee at a Mercedes dealership on top of a $450 a week salary.



Who will make more in the month of March given the following sales chart?

(10pts)

	BMW sales	**Mercedes sales**
1st week	$95000	$36000
2nd week	$135000	$125000
3rd week	$30000	$93000
4th week	$52000	$60000

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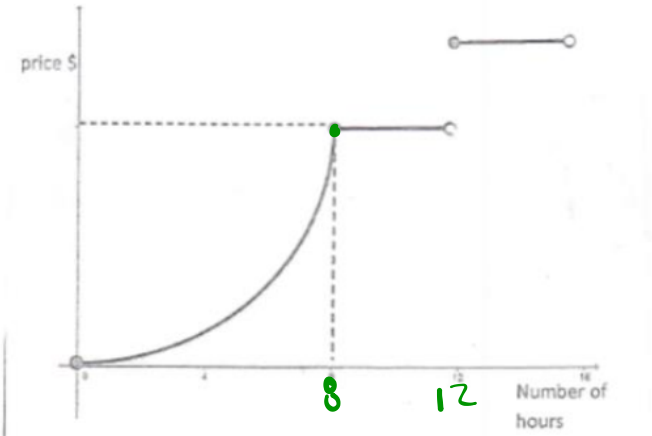
7. A yard and garden care contractor has developed a mathematical model to determine the price he will charge his clients throughout the season. In order to get his clients interested in his service, he gradually increases his price per hour as the hours accumulate. He illustrates this model in the graph below.



The first piece of the function is quadratic function given by the following rule:

$g(x) = 10x^2$ where $0 \leq x \leq 8$

The price will remain constant for the next 4 hours but after 12 hours, the contractor charges a flat rate of $250 for every four hours of work or part thereof.

One client is charged $1640.

What are the possible number of hours that job would have taken? Write your answers as an interval notation or as an inequality. (10pts)