

Functions REVIEW 2

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1. What is the value of y when

a)  $g(-10) = 3(-10)^2 + 4 = 304$

b)  $g(6) = 10$

c)  $g(20) = 1 - 6(20) = -119$

$$g(t) = \begin{cases} 3t^2 + 4 & \text{if } t \leq -4 \\ 10 & \text{if } -4 < t \leq 15 \\ 1 - 6t & \text{if } t > 15 \end{cases}$$

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2. If the Period for  $h(t)$  is 8.

$31 - 8 = 23$   
 $23 - 8 = 15$   
 $15 - 8 = 7$

Find a)  $h(-5) = h(-5+8) = h(3) = 3$     b)  $h(31) = h(7) = -3$

$h(-72)$

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3. If you have a **quadratic function** and one of the points is  $(27, -9)$ .

What is the rule of the function.

$$\begin{aligned}
 y &= ax^2 \\
 -9 &= a(27)^2 \\
 -9 &= a \cdot 729 \\
 \frac{-9}{729} &= \frac{a \cdot 729}{729} \\
 \frac{-9}{729} &= a \\
 \frac{-1}{81} &= a
 \end{aligned}$$

~~$$y = ax^2$$~~

$$y = -\frac{1}{81}x^2$$

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4. If you know population of St. Bruno that is **increasing** at a rate of **2.5%** and there were **30 000** people **5 years ago**. What will the population be in **4 more years**?

$$\begin{aligned}
 S &\bullet 30000 \\
 R &\bullet 1 + \% = 1 + 2.5\% = 1 + 0.025 = 1.025 \\
 T &: 5 + 4 = 9 \\
 y &= 30000 (1.025)^9 \\
 &= 37465.9
 \end{aligned}$$

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5. John and Jim are going for a ride in a hot air balloon. A monitor inside the basket records how high they have travelled according to the time that has passed in minutes.

The function  $f(x)$  represents their climb into the sky:

$f(x) = 1.25x^2$  where  $f(x)$  represents their height in meters  
 $x$  represents the number of minutes that have passed.

In how many minutes will they be at a height of 61.25m?

$$\begin{aligned} \frac{61.25}{1.25} &= \frac{1.25x^2}{1.25} \\ \sqrt{49} &= \sqrt{x^2} = \sqrt{x} \\ 7 &= x \end{aligned}$$

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6. Upon exposure to the sun, a 10-kg block of ice loses 30% of its mass for each minute that elapses. What is the mass of the block of ice after 300 seconds of being exposed to the sun?

$$S: 10$$

$$k: 1 - 30\% = 1 - 0.3 = 0.7$$

$$T: \frac{300}{60} = 5$$

$$y = 10(0.7)^5 = 1.68 \text{ kg}$$

$$\begin{array}{r} 6.8107 \\ \underline{\phantom{00}0.} \\ 1.68177 \\ \underline{\phantom{000}0.} \\ 1.69 \end{array}$$

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7. Stephan is trying to save \$2000. Stephan's plan is to put \$1000 into a savings account that will earn 8% per year. How long will it take for him to save the desired amount?

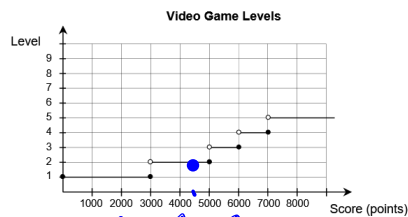
$S: 1000$   
 $k: 1 + 8\% = 1.08$   
 $T: 2$

$2000 = 1000 (1.08)^x$   
 $x = 9 \text{ yrs}$

$x$	
3	1259.71
5	1469.33
7	1713.0
9	1999

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8. The following graph represents the relation between the level a player reaches and the points scored in a video game.



Which of the following statements must be TRUE?

- A) If your score falls between 2000 and 4000 points, you are at level 1. **F**
- B) If your score is 4500 points, you are at level 3. **F**
- C) If your score is 6000 points, you are at level 4. **F**
- D) If your score is higher than 7000 points, you are at level 5. **T**

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9. Lucas and Martin each rented a moving truck. They each had to pay the rental cost and the insurance cost.

**Rental Cost**

Function  $f$  described below is used to determine the cost of renting a truck according to the length of time the truck is rented for.

$$f(x) = \begin{cases} 30x + 45 & \text{if } 0 < x \leq 5 \\ 20x + 95 & \text{if } x \geq 5 \end{cases}$$

where  $x$ : length of time the truck is rented for, in hours  
 $f(x)$ : cost of renting the truck, in dollars

The rental cost that Martin paid was \$180.

**Insurance Cost**

COST OF INSURANCE

The function represented in the Cartesian plane below is used to determine the cost of insurance according to the length of time the truck is rented for.

Lucas and Martin paid the same amount for insurance.

What is the maximum rental cost that Lucas could have paid?

M: 4.5 hrs → \$20  
 L: \$20 → 7 hrs      $y = 20(7) + 95 = \$235$

**Pike Outfitters Mornings**

$$f(x) = \begin{cases} 4 & \text{when } 5 < x \leq 8 \\ 4.5 & \text{when } 8 < x \leq 10 \\ 1.5 & \text{when } 10 < x \leq 12 \end{cases}$$

Where  $x$  represents the time of day, in hours, and  $f(x)$  represents the average number of fish caught per hour.

**Bass Outfitters**

**Afternoon and evening**

Time of day (in hours)	Number of fish caught during the time period
[12, 17]	10
[17, 19]	13
[19, 21]	14

Your uncle would like to spend 6 hours fishing. He plans to fish between 5:00 and 9:00 in the morning at Pike Outfitters and between 18:00 and 20:00 at Bass Outfitters.

He asks you to tell him the average number of fish per hour he can expect to catch tomorrow.

Pike { 5-6, 6-7, 7-8, 8-9 }  
 Bass { 18-19, 19-20 }

hrs	Avg # Fish
5-6	4
6-7	4
7-8	4
8-9	4.5
18-19	13
19-20	14
$\Sigma = 43.5$	

$Avg = \frac{43.5}{6} = 7.25/hr$