

Name: _____
Date: _____
Class: _____

Algebra
Unit 6
HW 6-5

1) When studying a population of bugs, it is discovered that they increase at a rate of 6% per month. If the population is 350 now, what will the population be in 3 weeks?

$$350 \cdot 1.06 \cdot 1.06 \cdot 1.06 = 416.8556$$

2416

2) Evaluate: Increasing 120 by 3.5%

$$120 \cdot 1.035 = 124.2$$

3) A cup of hot tea is decreasing in temperature at a constant rate of 6%. The cup is currently 200 degrees. To the nearest minute, how long will it take for the cup to be 150 degrees?

$$200 \cdot .94 = 188 \text{ (1)}$$

$$188 \cdot .94 = 176.72 \text{ (2)}$$
$$176.72 \cdot .94 = 166.1168 \text{ (3)}$$
$$166.1168 \cdot .94 = 156.15 \text{ (4)}$$

After 4 min it will be below ~~150~~ 150

4) Evaluate: Decrease \$22.50 by 8%

$$22.50 \cdot .92 = 20.7$$

5) The price of a barrel of oil has been decreasing at a rate of 3.5% per week. If it currently costs \$108 per barrel, what will the cost be at the end of 2 weeks?

$$100 - 3.5$$

96.5

$$108 \cdot .965^2 = \boxed{98.57}$$

6) A savings account grows by 3% per year. Sofia places \$500 in the account at the beginning of the year. Find the balance at the end of 1 year and at the end of 2 years. What was the average rate of change from $t = 0$ to $t = 1$ and what was the average rate of change from $t = 1$ to $t = 2$?

$$\begin{aligned}
 T=0 &\rightarrow 500 \\
 T=1 &\rightarrow 500 \cdot 1.03 = 515 \\
 T=2 &\rightarrow 515 \cdot 1.03 = 530.45
 \end{aligned}$$

Average of change

$T=0$ to $T=1$

$$\frac{515 - 500}{1 - 0} = \boxed{15}$$

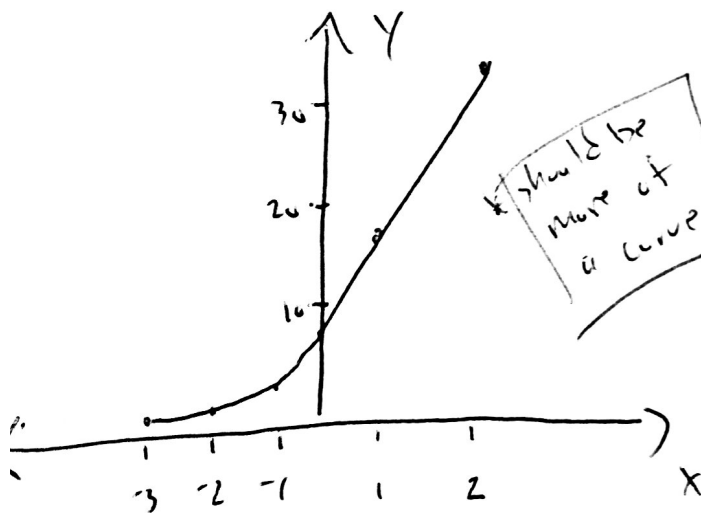
$$\frac{530.45 - 515}{2 - 1} = \boxed{15.45}$$

7) Increase the number 20 by 5% and then the result by 5% again. What is the total percent increase from the original 20 to the ending number?

$$20 \cdot 1.05 = 21 \cdot 1.05 = \boxed{22.05}$$

$$\frac{22.05}{20} = 1.1025 \rightarrow \boxed{10.25\%}$$

8) Sketch a graph of $f(x) = 8(2)^x$ on the interval $-3 \leq x \leq 2$



X	Y
-3	1
-2	2
-1	4
0	8
1	16
2	32