

MAT151 – College Algebra/Functions

Written Homework 2 – Transformation of Functions and Quadratic Functions

Print it, solve it (clear and understandable handwriting), take a picture, and mail it to me as a pdf file or just take a pic to a page with only the answers correctly numbered.

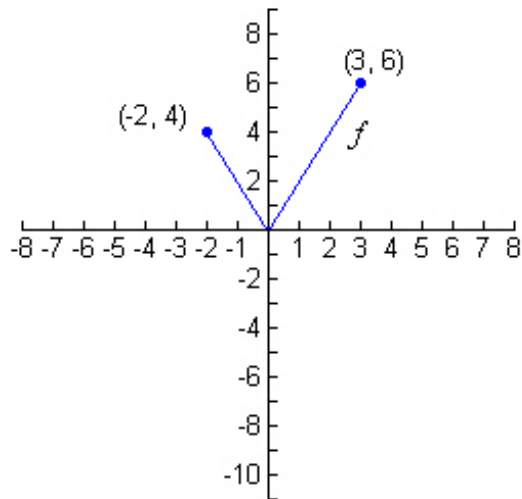
Name: _____

1. (20 points) Class V faculty at Victor Valley College in California earned $S(x) = 2215(x - 1) + 62,736$ dollars annually in 2009 - 2010. In the equation, x is the step level on the salary schedule. (Steps range from 1 to 20.) (Source: www.vvc.edu). The function $S(x)$ is a transformation of the function $f(x) = x$. Specifically, $S(x) = 2215f(x - 1) + 62,736$. Explain the graphical effect of each of the numbers in the transformation to the graph of f .

2. (20 points) The table shows the purchasing power of the U.S. dollar between 1980 and 2005 in constant 1982 dollars. That is, in 1982 the dollar is valued at \$1.000 (Source: Statistical Abstract of the United States: 2007, Table 705). Using average rate of change technique, estimates the value of the dollar in 2003.

Years since 1980 t	Value of the dollar (dollars) V
0	1.215
5	0.928
10	0.766
15	0.656
20	0.581
25	0.512

3. **(30 points)** The figure shows the graph of a function f . Graph $g(x) = f(x + 4) - 6$ on the same axes.



4. **(30 points)** Based on data from 1970 to 2004, the consumption of nuclear power in the United States can be modeled by $N(t) = -0.003084t^2 + 0.3512t + 0.04516$ quadrillion BTUs, where t is the number of years since 1970. (Source: Modeled from *Statistical Abstract of the United States, 2007*, Table 895). **Show your work and explain your method.**

- Algebraically, find the vertex of the quadratic function and interpret its meaning in the context of the problem **(10 points)**
- Algebraically, find the horizontal intercept of the quadratic function and interpret its meaning in the context of the problem **(10 points)**.
- Using technology, graph the function and identify the vertex, the horizontal and the vertical intercept. Use proper labels **(10 points)**