

Math 1410: Worksheet 5

September 17, 2021

Name: _____

1. Consider the function $f(x) = 2(x - 1)^4 + 3$.
 - (a) Find the vertex of f .
 - (b) Find all x - and y -intercepts of f .
 - (c) Sketch a graph of f , identifying the vertex and all intercepts.
 - (d) What is the difference quotient for $f(x)$ between two inputs $a < b$?
 - (e) What is the average rate of change of f from $x = 1$ to $x = 2$?

2. (a) Suppose you know that $f'(x)$, the function giving the instantaneous rate of change of $f(x)$, is a quadratic function which is always negative and has its vertex at $x = 2$. Use this information to sketch a graph of $f(x)$. What kind of function is $f(x)$? Where is $f(x)$ increasing/decreasing? Where is $f(x)$ concave up/concave down?
- (b) Suppose you know that $\text{dom } g = (-1, 1)$ and $\text{rang } g = (-2, 0]$. If $h(t) = 2g\left(\frac{t-1}{3}\right)$, what are the domain and range of h ?