AP Calculus AB – Worksheet 20 **Average Rates of Change**

1	Find the average rate of change of $f(x)=x^3+1$ over the interval $[2,3]$.
2	Find the average rate of change of $f(x)=\sqrt{4x+1}$ over the interval $[10,12]$.
3	Find the average rate of change of $f(x)=2+\cos x$ over the interval $[0,\pi]$.
4	*** Calculator *** The amount of money in a bank account, called the *balance*, after *t* years is $f(t)=100(1.08)^t$ dollars. a) What are the units of the rate of change of $f(t)$. b) Find the average rate of change of the balance over the time interval $[0,0.5]$. Explain the meaning of this value in the context of the bank account.
5	*** Calculator *** The amount of money in a bank account, called the *balance*, after *t* years is $f(t)=200(0.94)^t$ dollars. Find the average rate of change of the balance over the time interval $[0,0.5]$. Explain the meaning of this value in the context of the bank account.
6	The table below shows the weight, in lbs., of a grown man over a certain time period, *t*, in years. Consider the first year of the data collection period as $t=0$. Year: 0, 2, 5, 6, 10 Weight: 145, 160, 175, 160, 185 a) Estimate the rate of change of the man's weight over the time period $[0,5]$. Using correct units, explain the meaning of this value in the context of the man's weight. b) Estimate the rate of change of the man's weight over the time period $[2,6]$. Using correct units, explain the meaning of this value in the context of the man's weight.
7	Evalauate $\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$ for a) $f(x)=x^2-4x+5$ b) $f(x)=4x-7$
8	Find the equation of the line that passes through $(2,4)$ and is perpendicular to $2x-4y=7$.
9	Verify that $f(x)=\begin{cases}x^2+x-3, & x\le 2\\ 2x+1, & x>2\end{cases}$ is either continuous or discontinuous at $x=2$.