Average Rate of Change P-Set

A small web design company has fixed weekly costs of \$1650 and variable weekly costs of \$735 per employee,

1. Determine the linear cost function, $C(x)$.
2. Find and interpret $C(5)$.
3. Find the marginal cost of hiring a 6^{th} employee.

A new copier initially costs \$25,000 and depreciates at a rate of \$1,250 per year.

4. Determine an equation for the depreciation function.
5. In how many years will the machine be worth \$10,000?

Find the average rate of change for each function over each interval.

6. $f(x) = x^2 - x - 3; \quad [1, 4]$
7. $g(x) = -8x + 1; \quad [2, 3]$
8. $h(x) = 3\sqrt{x} - 5; \quad [9, 16]$

Given $f(x) = -3x^2 + 6x + 5$, find the average rate of change over each interval.

9. $[7, 7.1]$
10. $[7, 7.01]$
11. $[7, 7.001]$
12. $[7, 7.0001]$
13. What value do your outputs in the previous 4 problems get closer to?

Key:

1. $C(x) = 1650 + 735x$
2. $C(5) = 5325$; a staff of 5 has a weekly cost of \$5,325.
3. \$735 will be added to the weekly cost to hire a 6^{th} employee.
4. $f(x) = 25000 - 1250x$
5. 12 years
6. 4
7. -8
8. $\frac{3}{7}$
9. -36.3
10. -36.03
11. -36.003
12. -36.0003
13. -36