(c) Explain how to calculate the average price per bushel that Giant Farms will receive for their tomatoes.

The total number amount of tomatoes sold by Giant Farms is $1000\int_0^{50} B(t)\,dt = 2,500,000$ *bushels. The average price received per bushel is equal to the total amount of money received divided by the number of bushels sold or*

$$\frac{14,062,500}{1000\int_0^{50} B(t)\,dt} = \frac{14,062,500}{2,500,000} = 5.625 \quad \textit{dollars per bushel.}$$

10. (6 points) Explain how Taylor polynomials can be viewed as generalizations of linear approximation. (A good answer to this problem could begin by discussing a special case such as $P_2(x)$, illustrating your points with graphs and equations.)

The tangent line approximation to a function f *near a point* $x = a$ *is given by the first degree polynomial* $P_1(x) = f(a) + f'(a)(x-a)$ *whose graph, a straight line, passes through through the point* $(a, f(a))$ *and has slope equal to* $f'(a)$. *The Taylor polynomial* P_n *of degree of degree* $n > 1$ *that approximates* f *near a point* a *refines this idea by matching not only the function and first derivative values but also all the derivatives of order up to* n. *That is,*

$$f^{(j)}(a) = P_n^{(j)}(a), \quad 0 \le j \le n.$$

As n *increases, the Taylor polynomials* P_n *are expected to give better and better approximations to* f *for* x *near* a, *as illustrated in the following figure which shows the graph of a function, in this case* $f(x) = \ln x$ *and it's Taylor polynomials of degree 1,2, and 5 near the point* $a = 1$.