1. Use the Fundamental Theorem of Calculus Part II to find the areas of the following regions:

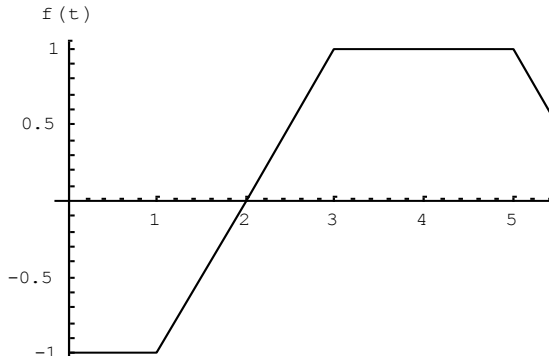
   (a) Between $f(x)=\sqrt{x}$ and $g(x)=x^2$ with $0\le x\le 1$.

   (b) Between $f(x)=\cos x$ and $g(x)=\sin x$ with $0\le x\le \pi$.

   (c) Between $h(t)=\dfrac{1}{t}$ and the *t*-axis *and* with $-e^2\le x\le -e/2$

2. Find the exact value of *c* so that the area between the graph of $y=x^2-c^2$ and the *x*-axis is 36.

3. Use the figure below to answer the following:

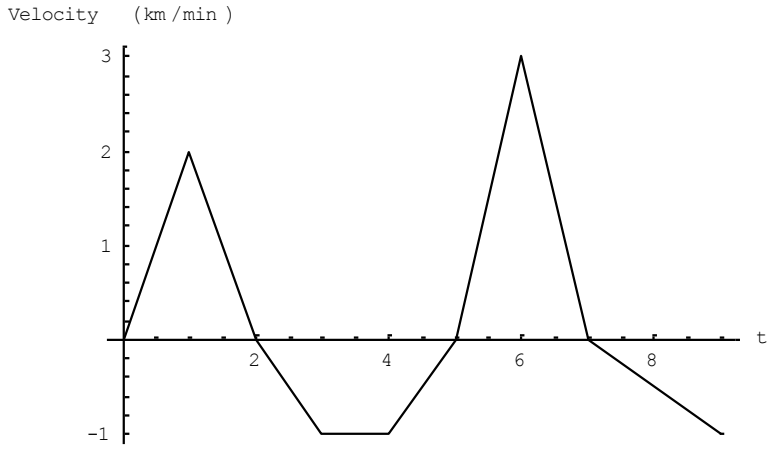


   (a) Find the average value of $f(t)$ over the interval $0\le t\le 6$.

   (b) Suppose you are told that $f(t)$ is an even function. Find $\int_{-6}^{6} f(t)dt$.

   (c) Suppose that F is a function with $F'=f$ and $F(0)=-1$. Use the Fundamental Theorem of Calculus to compute $F(2)$.

4. A car is traveling along a straight road from Town *A* to Town *B* with velocity, *v*, given in the figure below. The two towns are 10 km apart and the car starts 5 km away from Town *A*; positive velocities mean the car is traveling away from Town *A* (towards Town *B*) and negative velocities mean the car is traveling towards Town *A*.



(a) How far away from Town *A* is the car after 4 minutes?

(b) How close does the car get to Town *B*?

(c) How many kilometers did the car travel during the nine minute period?