Find the average value for each function

$$f(x) = -\frac{x^2}{2} + x + \frac{3}{2};\ [-3, 1]$$

$$f(x) = \frac{4}{x^2};\ [-4, -2]$$

3. In a certain city the temperature (in °F) t hours after 9 a.m. was modeled by the function

$$T(t) = 50 + 14\sin\left(\frac{\pi t}{12}\right)$$

Find the average temperature from 9 a.m to 9 p.m. Hint: What is the interval for t in this

4. Water is pumped into a tank at a rate modeled by $W(t) = 200e^{-t^2/20}$ liters per hour for $0 \le t \le 8$ where t is measured in hours. Determine the average amount of water pumped into the tank during the first 8 hours.

The inside of a funnel of height 10 inches has circular cross sections.

At height h, the radius of the funnel is given by

$$r = \frac{1}{20}\left(3 + h^2\right)$$

where $0 \le h \le 10$. The units of r and h are in inches.

a) Find the average value of the radius of the funnel.