Find the average value for each function

$$
\begin{gathered}
f(x)=-\frac{x^{2}}{2}+x+\frac{3}{2} ;[-3,1] \\
f(x)=\frac{4}{x^{2}} ;[-4,-2]
\end{gathered}
$$

3. In a certain city the temperature (in ${ }^{\circ} \mathrm{F}$ ) t hours after $9 \mathrm{a} . \mathrm{m}$. 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 $W(t)=200 e^{-t^{2} / 20}$ liters per hour for $0 \leq t \leq 8$ 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 $0 \leq h \leq 10$. The units of $r$ and $h$ are in inches.
a) Find the average value of the radius of the funnel.

