Section 14.9, problem 60: The Gini coefficient for the Lorenz curve $f(x)=\frac{11}{12} x^{2}+\frac{1}{12} x$ is

$$
\gamma=\frac{\int_{0}^{1} x-\left(\frac{11}{12} x^{2}+\frac{1}{12} x\right) d x}{\frac{1}{2}}
$$

Which as we saw in class (you can also look at the notes from the lecture on the course website), simplifies to

$$
\gamma=1-2 \int_{0}^{1} \frac{11}{12} x^{2}+\frac{1}{12} x d x=1-2\left[\frac{11}{36} x^{3}+\left.\frac{1}{24} x^{2}\right|_{0} ^{1}\right]=1-2\left(\frac{11}{36}+\frac{1}{24}\right)=\frac{11}{36} \approx 0.306
$$

## Section 14.10, problem 4:

(1) Point of equilibrium:
$900-q^{2}=10 q+300 \Longrightarrow q^{2}+10 q-600=0 \Longrightarrow(q-20)(q+30)=0 \Longrightarrow q=20$ or $q=-30$ Equilibrium: $q^{*}=20$ and $p^{*}=900-20^{2}=500$.
(2) Consumers' surplus:

$$
C S=\int_{0}^{q^{*}} \text { demand }-p^{*} d q=\int_{0}^{20} 900-q^{2}-500 d q=400 q-\left.\frac{q^{3}}{3}\right|_{0} ^{20}=\frac{16000}{3} \approx 5333.33
$$

(3) Producers' surplus:

$$
P S=\int_{0}^{q^{*}} p^{*}-\text { supply } d q=\int_{0}^{20} 500-(10 q+300) d q=200 q-\left.5 q^{2}\right|_{0} ^{20}=2000
$$

Section 15.4, problem 8: The average value of $f(x)=5 / x^{2}$ on the interval $[1,3]$ is

$$
\operatorname{Avg}(f)=\frac{1}{3-1} \int_{1}^{3} 5 x^{-2} d x=\frac{5}{2}\left[\left.\frac{x^{-1}}{-1}\right|_{1} ^{3}\right]=\frac{5}{2}\left(-\frac{1}{3}-(-1)\right)=\frac{5}{3}
$$

