

# Math 122 HW #9

8.4 #2, 20, 52

6.1 #33, 41

8.4 #2

$$\int_7^{\infty} \frac{1}{x^2} dx = \lim_{b \rightarrow \infty} \int_7^b x^{-2} dx = \lim_{b \rightarrow \infty} -x^{-1} \Big|_7^b$$

$$= \lim_{b \rightarrow \infty} -b^{-1} - (-7^{-1}) = 0 + 7^{-1} = \frac{1}{7}$$

8.4 #20

$$\int_0^{\infty} \frac{1}{(4x+1)^3} dx = \lim_{b \rightarrow \infty} \int_0^b \frac{1}{(4x+1)^3} dx \quad \begin{array}{l} u = 4x+1 \\ du = 4dx \end{array}$$

$$= \lim_{b \rightarrow \infty} \int_{x=0}^{x=b} u^{-3} \cdot \frac{1}{4} du = \lim_{b \rightarrow \infty} \frac{1}{4} \cdot \frac{1}{-2} u^{-2} \Big|_{x=0}^{x=b}$$

$$= \lim_{b \rightarrow \infty} -\frac{1}{8} (4x+1)^{-2} \Big|_0^b = \lim_{b \rightarrow \infty} -\frac{1}{8} (4b+1)^{-2} - \left( -\frac{1}{8} (0+1)^{-2} \right)$$

$$= \frac{1}{8}$$

6.4 #52

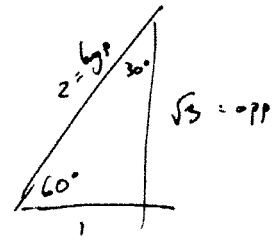
$$\int_0^{\infty} 50 e^{-.04t} dt = \lim_{b \rightarrow \infty} \int_0^b 50 e^{-.04t} dt = \lim_{b \rightarrow \infty} \frac{50}{-.04} e^{-.04t} \Big|_0^b$$

$$= \lim_{b \rightarrow \infty} -\frac{50}{.04} e^{-.04b} - \left( -\frac{50}{.04} e^{-.04 \cdot 0} \right)$$

$$= \frac{50}{.04} = 1250$$

13.1 # 33

$$\begin{aligned}\sin \frac{\pi}{3} &= \sin 60^\circ \\ &= \frac{\text{opp}}{\text{hyp}} = \frac{\sqrt{3}}{2}\end{aligned}$$



13.1 # 41

$$\begin{aligned}\sin \frac{7\pi}{4} \\ &= \frac{\text{opp}}{\text{hyp}} = \frac{-1}{\sqrt{2}}\end{aligned}$$

