

Math 1172

Homework #1

Section 4.3 #25/33

Section 4.4 #9/13

Section 4.5 #29/31

Section 5.1 #11/17

4.3 #25/33

$$\int_{\pi/6}^{\pi} \sin \theta \, d\theta = -\cos \theta \Big|_{\pi/6}^{\pi} = -\cos \pi - (-\cos \pi/6) \\ = -(-1) + \frac{\sqrt{3}}{2} = 1 + \frac{\sqrt{3}}{2}$$

4.4 #9/13

$$\int (u+4)(2u+1) \, du = \int 2u^2 + 9u + 4 \, du = \frac{2}{3}u^3 + \frac{9}{2}u^2 + 4u + C$$

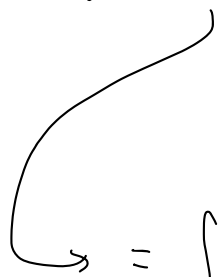
4.5 #29/31

$$\int x(2x+5)^8 \, dx$$

$$u = 2x+5 \rightarrow x = \frac{1}{2}(u-5)$$

$$du = 2dx$$

$$\frac{1}{2} du = dx$$



$$= \int x u^8 \, dx = \int \frac{1}{2}(u-5) u^8 \cdot \frac{1}{2} du$$

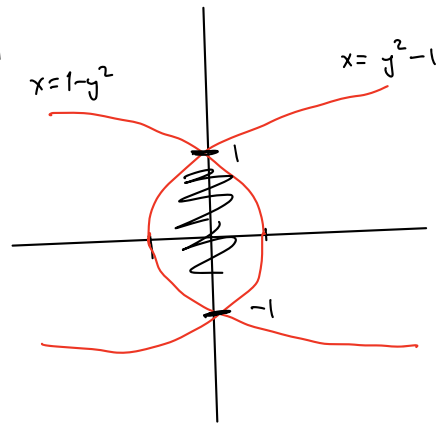
$$= \frac{1}{4} \int (u-5) u^8 \, du = \frac{1}{4} \int u^9 - 5u^8 \, du$$

$$= \frac{1}{4} \left(\frac{1}{10} u^{10} - \frac{5}{9} u^9 \right) + C$$

$$= \frac{1}{4} \left(\frac{1}{10} (2x+5)^{10} - \frac{5}{9} (2x+5)^9 \right) + C$$

5.1 # 11/17

Area between $x = 1 - y^2$ & $x = y^2 - 1$



$$\int_{-1}^1 (1 - y^2) - (y^2 - 1) dy$$

$$= \int_{-1}^1 1 - y^2 - y^2 + 1 dy$$

$$= \int_{-1}^1 2 - 2y^2 dy = 2y - \frac{2}{3}y^3 \Big|_{-1}^1$$

$$= 2 \cdot 1 - \frac{2}{3} \cdot 1^3 - \left(2 \cdot (-1) - \frac{2}{3}(-1)^3 \right)$$

$$= 4 - \frac{4}{3} = \frac{8}{3}$$