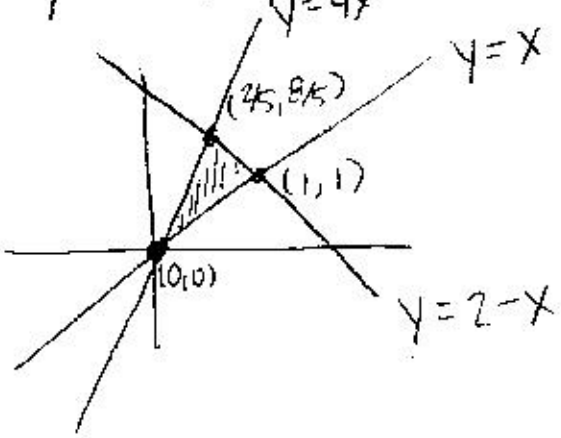
Section 6.1 Graded Problems

18. $y=x$, $y=4x$, $y=-x+2$ (find area)

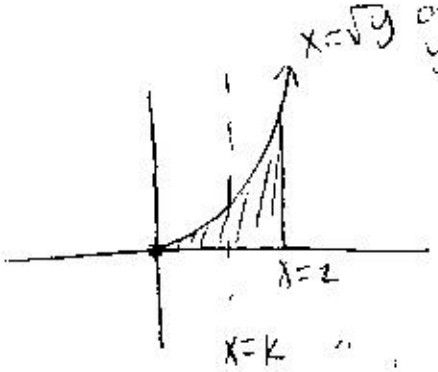


$$\text{Area} = \int_0^{2/5} 4x - x\,dx + \int_{2/5}^{1} (2-x) - x\,dx$$

$$= \int_0^{2/5} 3x\,dx + \int_{2/5}^{1} 2 - 2x\,dx$$

$$= \frac{3}{2}x^2\Big|_0^{2/5} + 2x - x^2\Big|_{2/5}^{1} = \boxed{\frac{3}{5}}$$

36.



$$\int_0^k x^2\,dx = \int_k^2 x^2\,dx$$

$$\frac{1}{3}x^3\Big|_0^k = \frac{1}{3}x^3\Big|_k^2$$

$$\frac{1}{3}k^3 = \frac{8}{3} - \frac{1}{3}k^3$$

$$\frac{2}{3}k^3 = \frac{8}{3}$$

$$k^3 = 4$$

$$\boxed{k = \sqrt[3]{4}}$$