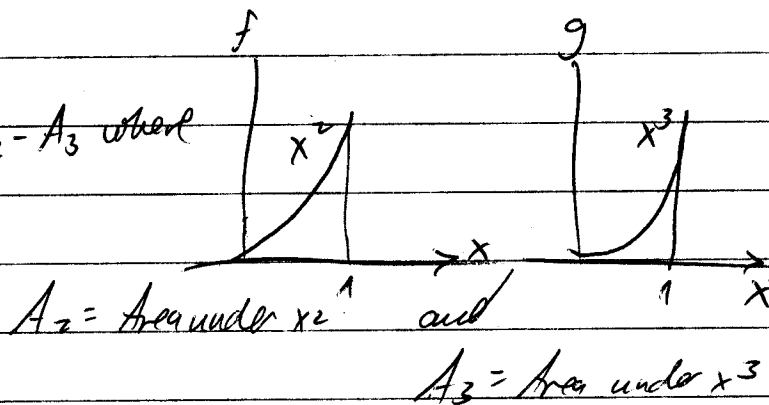
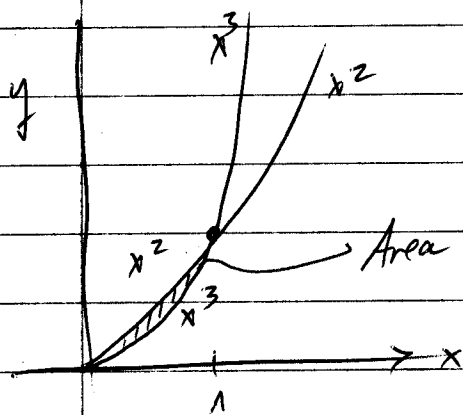
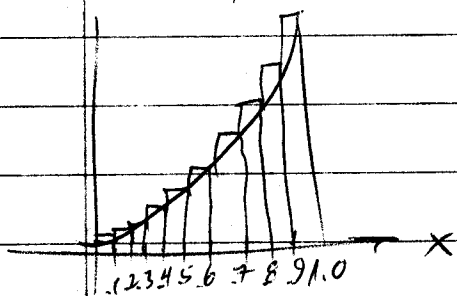


Calculus Ch 5.2 #20 Find the area between $f = x^2$ and $g = x^3$, between $x=0$ and $x=1$



Let's split this into 10 intervals



$$\Delta x = \frac{1}{10}, x_1 = \frac{1}{10}, x_2 = \frac{2}{10}, x_3 = \frac{3}{10}, \dots, x_{10} = \frac{10}{10}$$

$$A = \sum f(x_i) \Delta x = f(x_1) \Delta x + f(x_2) \Delta x + \dots + f(x_{10}) \Delta x$$

$$A_2 = x_1^2 \Delta x + x_2^2 \Delta x + \dots + x_{10}^2 \Delta x$$

$$= \Delta x (x_1^2 + x_2^2 + \dots + x_{10}^2)$$

$$= \frac{1}{10} \left(\left(\frac{1}{10}\right)^2 + \left(\frac{2}{10}\right)^2 + \dots + \left(\frac{10}{10}\right)^2 \right)$$

$$= \frac{1}{10} \left(\frac{1}{10}\right)^2 (1^2 + 2^2 + \dots + 10^2)$$

$$A_2 = \frac{1}{1000} (385) = 0.385$$

Similarly, $A_3 = \frac{1}{10} \left[\left(\frac{1}{10}\right)^3 [1^3 + 2^3 + \dots + 10^3]\right]$

$$A_3 = \frac{1}{1000} (3025) = 0.3025$$

So $A = A_2 - A_3 = 0.385 - 0.3025 = 0.083$