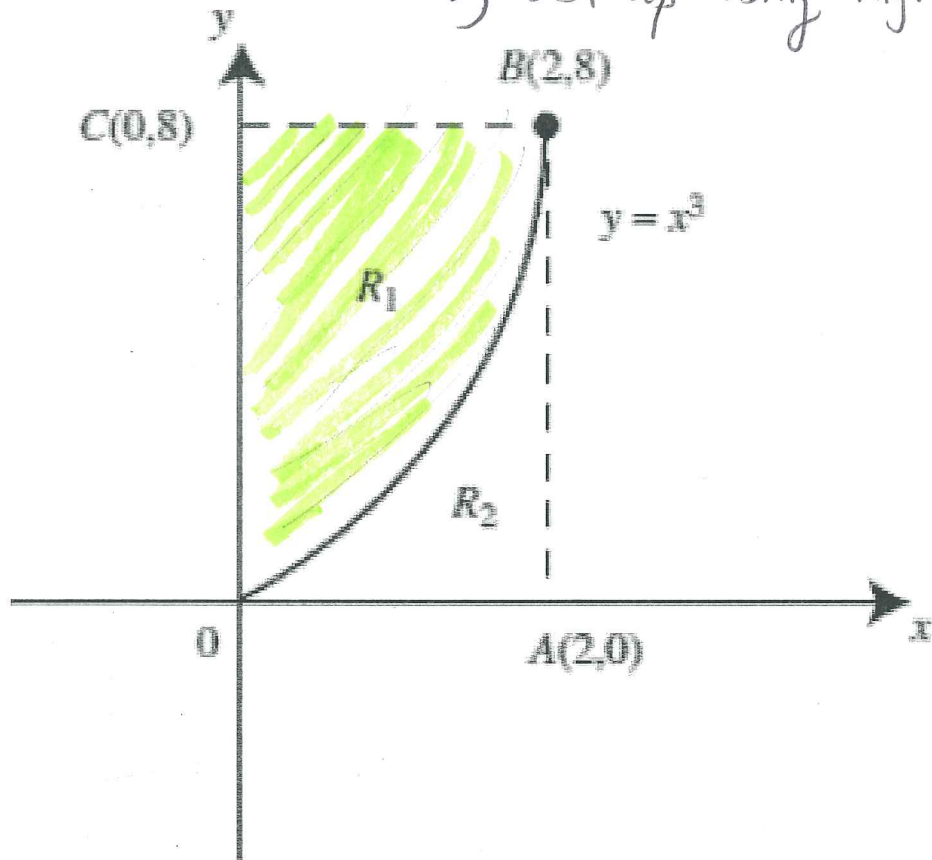


In-Class 7.1 Quiz Review

1. Find Region R_1

a) Set up using Top/Bottom

b) Set up using Right/Left

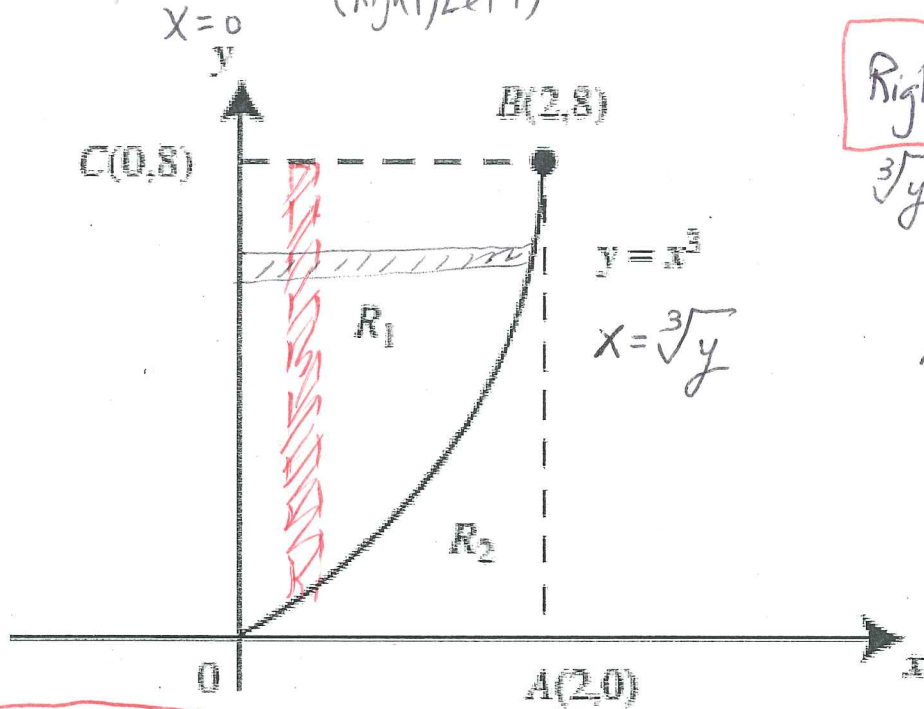


2. Find area of bounded region(s) $y = x^3 - 2x$ and $y = x^2$

in interval $[-2, 0]$

In-Class 7.1 Quiz Review

1. Find Region R_1 (Right/Left)



Right/Left

$$\sqrt[3]{y} - 0$$

$$A = \int_0^8 \sqrt[3]{y} - 0 \, dy = \int_0^8 y^{1/3} \, dy$$

$$\left[\frac{3}{4} y^{4/3} \right]_0^8 = \frac{3}{4} (8)^{4/3}$$

$$= \frac{3}{4} (2)^4 = 3$$

$$= \frac{3}{4} (16) = \boxed{12}$$

Top/bottom

$$A = \int_0^2 8 - x^3 \, dx$$

$$\left[8x - \frac{x^4}{4} \right]_0^2 = 16 - \frac{16}{4} = 16 - 4 = \boxed{12}$$

2. Find area of bounded region(s) $y = x^3 - 2x$ and $y = x^2$ $[-2, 0]$

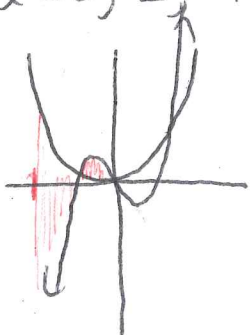
$$x^3 - 2x = x^2$$

$$x^3 - x^2 - 2x = 0$$

$$x(x^2 - x - 2) = 0$$

$$x(x-2)(x+1) = 0$$

$$x = 0, 2, -1$$



$$A = \int_{-2}^{-1} \underbrace{x^2}_{\text{top}} - \underbrace{(x^3 - 2x)}_{\text{bottom}} \, dx + \int_{-1}^0 \underbrace{x^3 - 2x}_{\text{top}} - \underbrace{x^2}_{\text{bottom}} \, dx$$

$$\int x^2 - x^3 + 2x \, dx$$

$$\left[\frac{x^3}{3} - \frac{x^4}{4} + \frac{2x^2}{2} \right]_{-2}^{-1}$$

$$\left[\frac{-1}{3} - \frac{1}{4} + 1 - \left(\frac{-8}{3} - \frac{16}{4} + 4 \right) \right]$$

$$\frac{-1}{3} - \frac{1}{4} + 1 + \frac{8}{3} + 0 = \frac{37}{12}$$

$$\left[\frac{x^4}{4} - \frac{2x^2}{2} - \frac{x^3}{3} \right]_{-1}^0$$

$$0 - \left(\frac{1}{4} - 1 + \frac{1}{3} \right) = \frac{5}{12}$$

$$\frac{37}{12} + \frac{5}{12} = \frac{42}{12} = \boxed{\frac{7}{2}}$$