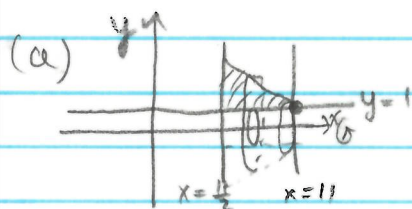


MA16020
LESSON 14
Extra Examples!

pg. 4

Ex 5. Let S be the region bounded above $x^3 y = 1331$, below $y=1$, on the left by $x = \frac{11}{2}$, on the right by $x=11$. Find the volume obtained by rotating S about
(a) x -axis (b) $y=1$ (c) y -axis (d) $x = \frac{11}{2}$

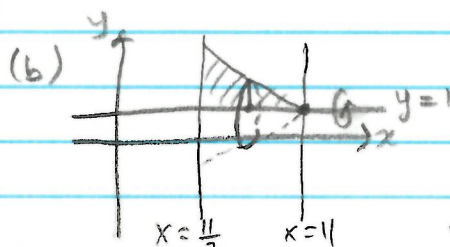


$$R = 1331x^{-3}, r = 1$$

washers vary from $x = \frac{11}{2}$ to $x=11$

$$V = \pi \int_{\frac{11}{2}}^{11} [(1331x^{-3})^2 - (1)^2] dx$$

$$\approx 196.978$$

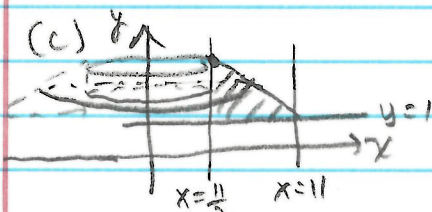


$$R = 1331x^{-3} - 1$$

disks vary from $x = \frac{11}{2}$ to $x=11$

$$V = \pi \int_{\frac{11}{2}}^{11} (1331x^{-3} - 1)^2 dx$$

$$\text{(FOIL)} \quad \approx 127.863$$

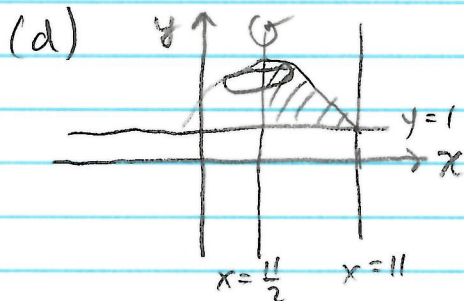


$$R = \sqrt[3]{\frac{1331}{y}}, r = \frac{11}{2}$$

washers vary from $y=1$ to $y=8$
(since $(\frac{11}{2})^3 y = 1331 \Rightarrow y=8$)

$$V = \pi \int_1^8 [1331^{2/3} y^{-2/3} - (\frac{11}{2})^2] dy$$

$$\approx 475.166$$



$$R = \sqrt[3]{\frac{1331}{y}} - \frac{11}{2}$$

disks vary from $y=1$ to $y=8$

$$V = \pi \int_1^8 (11y^{-1/3} - \frac{11}{2})^2 dy$$

$$\text{(FOIL)}$$

$$\approx 95.033$$