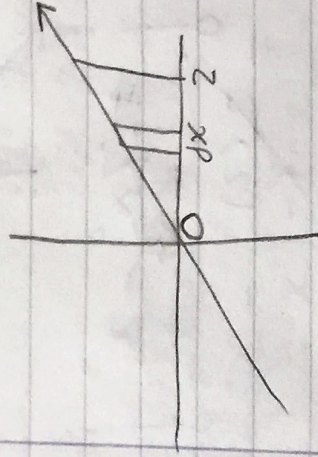


4.6 Area between the Curves

- Fundamental Theorem of Calculus: $A = \int_a^b (\text{upper function} - \text{lower function})$

② $y = \frac{1}{2}x$ $x=2$



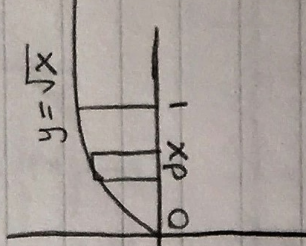
what graph is bounded w/

$$\int_0^2 \left(\frac{1}{2}x - 0 \right) dx = \int_0^2 \frac{1}{2}x dx$$

$$= \frac{1}{2} \int_0^2 x dx = \frac{1}{2} \left[\frac{x^2}{2} \right]_0^2 = \frac{x^2}{4} \Big|_0^2 = \frac{4}{4} = 1$$

① $y = \sqrt{x}$ $x=1$ x axis ($y=0$)

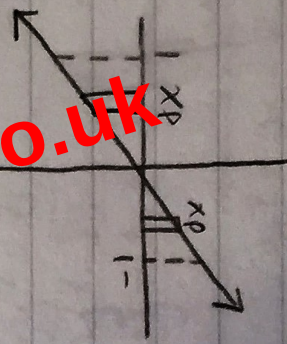
$$\int_0^1 x^{1/2} dx = \frac{x^{1/2 + 1/2}}{1/2 + 1/2} \Big|_0^1 = \frac{2}{3} x^{3/2} \Big|_0^1 = \frac{2}{3} (1)^{3/2} = \frac{2}{3}$$



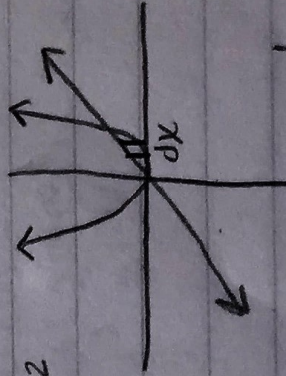
② $y = x$ x axis ($y=0$) $x=1$ $x=-1$

$$\int_{-1}^1 x dx = \frac{x^2}{2} \Big|_{-1}^1 = \frac{1}{2} + \frac{1}{2} = 1$$

pick one



22) $y = x$ $y = x^2$



$$\int_0^1 (x - x^2) dx = \frac{x^2}{2} - \frac{x^3}{3} \Big|_0^1 = \frac{1(2)}{2(2)} - \frac{1(3)}{3(3)} = \frac{1}{6}$$

upper lower

common denominator

* want area of the bounded

* make 2 graphs to each other

* make equations to find bound