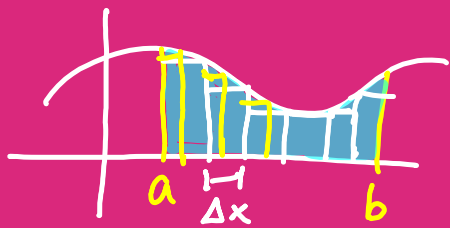


$l \cdot w$

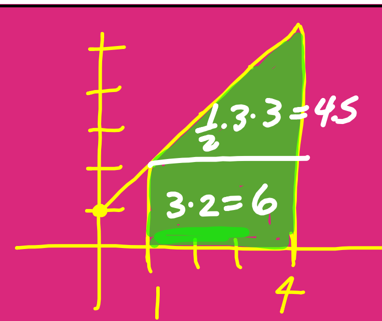
$$\lim_{\Delta x \to 0} \sum_{x=a}^{b} f(x) \cdot \Delta x$$

$$= \int_a^b f(x)\, dx$$

sum of the rectangles

Integration represents the area between a function & an axis.

$f(x) = x+1$



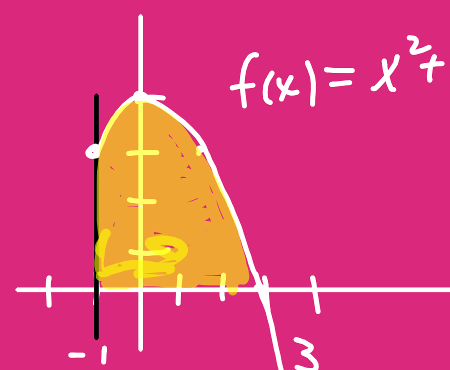
Area = 10.5 ft^2

$$\int_1^4 (x+1)\,dx$$

$$= \frac{x^2}{2} + x \Big|_1^4$$

$$= 8+4+\left(\frac{1}{2}+1\right) = 10.5$$

$f(x) = x^2+4$



$$\int_{-1}^{3} (x^2+4)\,dx$$

$$= \frac{x^3}{3} + 4x \Big|_{-1}^{3}$$

$$= 9+12+\left(+\frac{1}{3}+4\right)$$

$$= 25\tfrac{1}{3} \text{ or } \frac{76}{3} \text{ units}^2$$

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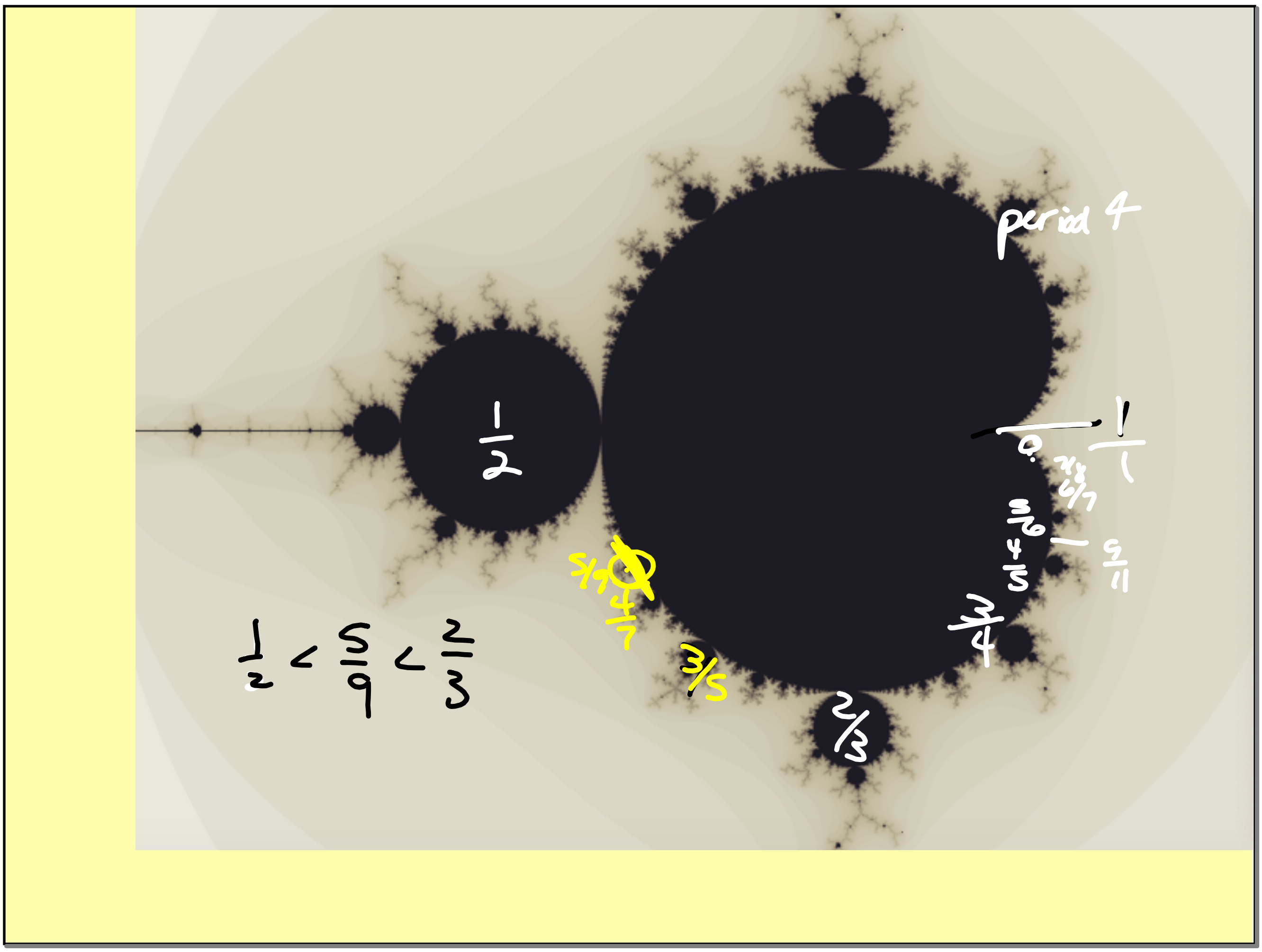

Calculus

3 Limit

3 Deriv.

3 Integ.

- A Derivative represents the slope.... of a line tangent to a curve at a given pt.

- Integ. represents the area between a function & an axis.

Definition of Deriv.

$$\lim_{x \to a} \frac{f(x)-f(a)}{x-a}$$

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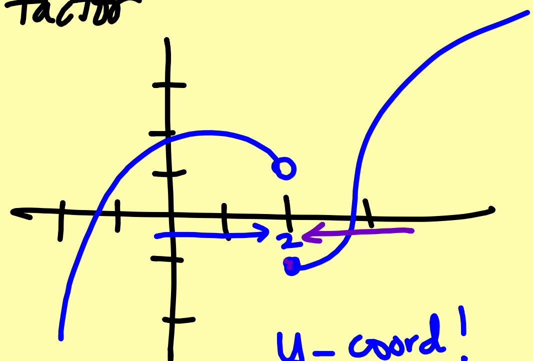
$$\lim_{x\to 16}\frac{\sqrt{x}-4}{x-16}\frac{(\sqrt{x}+4)}{(\sqrt{x}+4)}=\frac{0}{0}$$

1) Sub # in
2) If $\frac{0}{0}$,
   a) conjugate
   b) factor

$$\lim_{x\to 16}\frac{\cancel{x-16}}{\cancel{(x-16)}(\sqrt{x}+4)}$$

$$=\frac{1}{\sqrt{16}+4}=\frac{1}{8}$$



y-coord!

$$\lim_{x\to 2^-} f(x)=1$$

$$\lim_{x\to 2^+} f(x)=-1$$

$$\lim_{x\to 2} f(x)=\text{DNE}$$

$$f(2)=-1$$

$$f_1(x) = \sqrt{\frac{x^3+7x+4}{(8x^7-6x)^9}} = \left(\frac{x^3+7x+4}{(8x^7-6x)^9}\right)^{1/2}$$

Find $f'(x)$

Deriv = Decrease power

$$f'(x) = \frac{1}{2}\left(\text{All}\right)^{-1/2} \cdot \frac{(8x^7-6x)^9 \cdot (3x^2+7) - (x^3+7x+4)\cdot 9(8x^7-6x)^8 \cdot (56x^6-6)}{(8x^7-6x)^{18}}$$