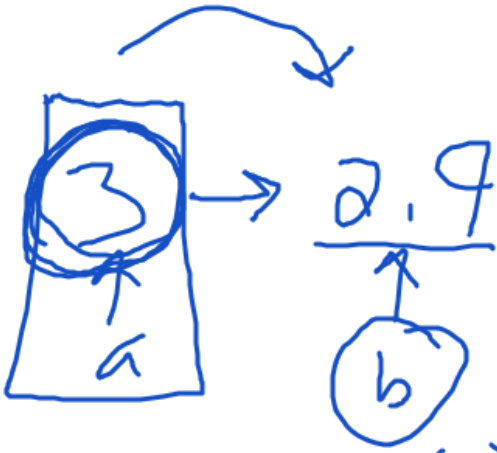


HW IS #2

dy of $f(x) = \frac{-4}{x-2}$ as x 

~~dy~~ $\Delta y = f(b) - f(a)$

$$f'(x) = \frac{(x-2)(0) - (-4)(1)}{(x-2)^2}$$

$$dy = f'(a)(b-a)$$

$$dy = 4(2.9 - 3)$$

$$f'(x) = \frac{4}{(x-2)^2}$$
$$f'(3) = 4$$

$$dy = -0.4$$

HW 15 #7

$$f(x) = (x+3)^{1/2} \quad a = 22$$

$$L(x) = f(a) + f'(a)(x-a)$$
$$= 5 + \frac{1}{10}(x-22)$$

$$f'(x) = \frac{1}{2}(x+3)^{-1/2}$$

$$f'(x) = \frac{1}{2\sqrt{x+3}}$$

$$f'(22) = \frac{1}{2 \cdot 5} = \frac{1}{10}$$

$$\sqrt{x+3} = \sqrt{24.9}$$

$$x+3 = 24.9 \Rightarrow$$

$$x = 21.9$$

$$\boxed{(24.9)^{1/2}} \rightarrow (25.01)^{1/2}$$

$$\frac{L(x) = 5 + \frac{1}{10}(x - 22)}{(24.9)^{1/2}} \quad \begin{array}{l} \curvearrowright \\ x = 21.9 \end{array}$$
$$= 5 + \frac{1}{10} \underbrace{(21.9 - 22)}_{-0.1 = -\frac{1}{10}}$$

$$= 5 + \frac{1}{10} \left(-\frac{1}{10} \right)$$
$$= 5 - \frac{1}{100} = \boxed{4.99}$$

$$\frac{(25.01)^{1/2}}{\sqrt{x+3}} = \sqrt{25.01}$$

$$x+3 = 25.01$$

$$x = 22.01$$

$$L(x) = 5 + \frac{1}{10} \underbrace{(22.01 - 22)}_{0.01 = \frac{1}{100}}$$

$$5 + \frac{1}{10} \left(\frac{1}{100} \right)$$
$$= \boxed{5.001}$$

HW 16 #1

$$f(x) = \frac{1}{5}x^5 - \frac{9}{4}x^4 + 9x^3 - \frac{27}{2}x^2 - 20$$

Rational root
Thm

$$f'(x) = x^4 - 9x^3 + 27x^2 - 27x$$

~~$\pm 27, \pm 9, \pm 3, \pm 1$~~

$$= \underline{x} (x^3 - 9x^2 + 27x - 27)$$

+3 | 1 -4 27 -27
 ↓ +3 -18 27

1	-6	9	0
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$$= x(x-3)(x^2 - 6x + 9)$$
$$= x(x-3)(x-3)(x-3)$$
$$f'(x) = \underline{x(x-3)^3} = 0 \quad \boxed{\begin{matrix} x=0 \\ x=3 \end{matrix}}$$

HW 16 # 6

$$f(x) = \cos(x) + [\sin(x)]^2$$

$[0, 2\pi]$

$$f'(x) = -\sin(x) + 2 \sin(x) \cos(x)$$

$$0 = \sin(x) [2 \cos(x) - 1]$$

$$\sin(x) = 0$$

$$x = 0, x = \pi, x = 2\pi$$

$$2 \cos(x) - 1 = 0$$

$$\cos(x) = \frac{1}{2}$$

$$x = \frac{\pi}{3}, x = \frac{5\pi}{3}$$

