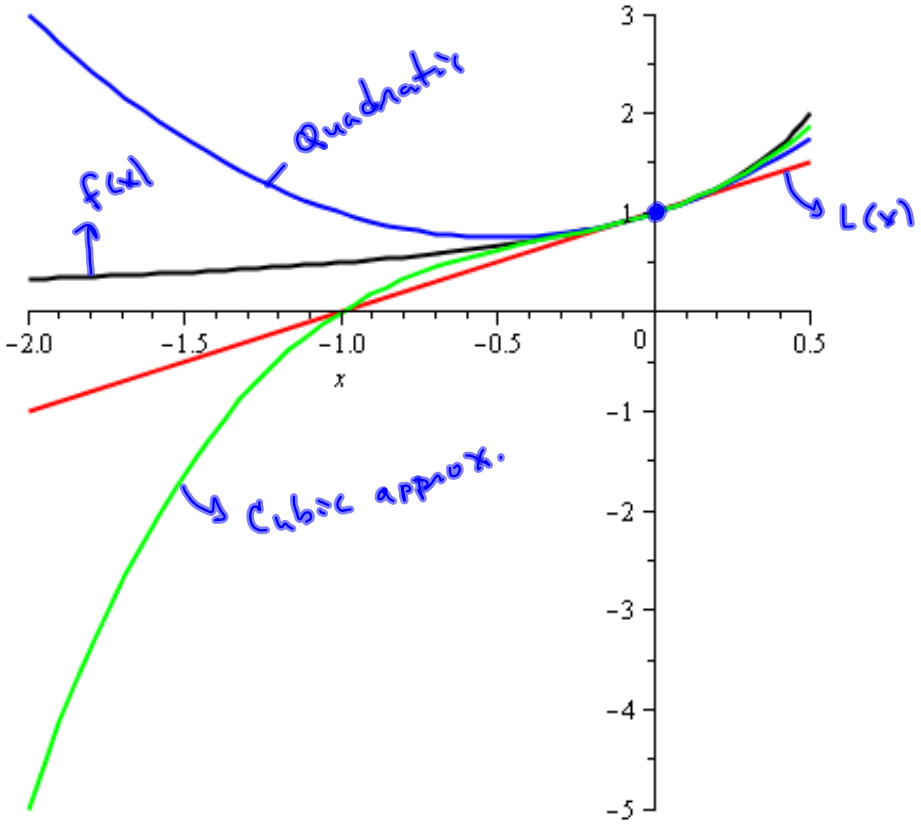
$plot([f(x), L(x), Q(x), C(x)], x = -2..0.5, thickness = 2, color = [black, red, blue, green])$



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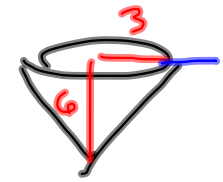


$\frac{r}{h} = \frac{3}{6} = \frac{1}{2}$

$r = \frac{1}{2}h$ lets you eliminate r in one of the parts to the question

#1

$-\frac{645}{8}$

$\frac{703}{27}$

Typo on #54, 3.9 Solution boo-boo

$$Q(x) = b_0 + b_1(x-a) + b_2(x-a)^2$$

$$Q(a) = f(a) = b_0$$

$$Q'(x) = b_1 + 2b_2(x-a) \Rightarrow$$

$$Q'(a) = b_1 = f'(a)$$

$$Q''(x) = 2b_2$$

$$Q''(a) = 2b_2 = f''(a), \text{ so}$$

$$b_2 = \frac{f''(a)}{2}$$

$$Q(x) = f(a) + f'(a)(x-a) + \frac{f''(a)}{2!}(x-a)^2$$

§4.1 # 31 $f(\theta) = \sin\theta$

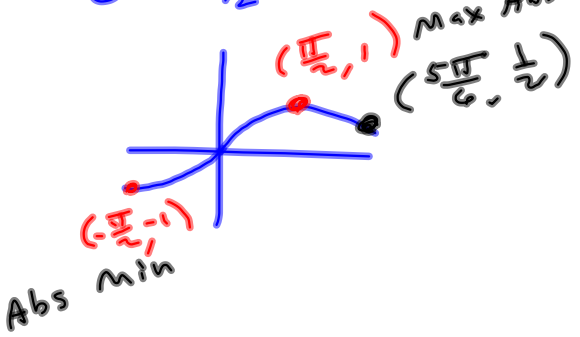
Find abs. max/min on $[-\frac{\pi}{2}, \frac{5\pi}{6}]$

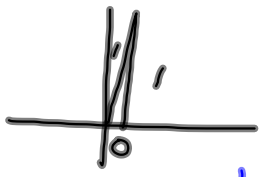
Then graph.

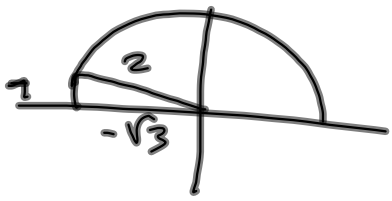
$f'(\theta) = \cos\theta \overset{SET}{=} 0$

$\theta = \frac{\pi}{2} + 2n\pi$ $\left.\right\} n \in \mathbb{Z}$

$\theta = \frac{3\pi}{2} + 2n\pi$ $\left.\right\}$







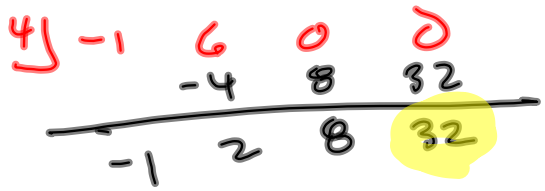
Find all critical points:

$f(x) = 6x^2 - x^3$

$f'(x) = 12x - 3x^2 \overset{\text{SET}}{=} 0$

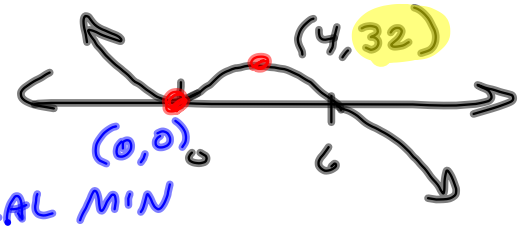
$3x(4-x) = 0$

$x = 0$ or $x = 4$



$-x^3 + 6x^2$

$-x^2(x-6)$



#s 59-66 Find: cp's, Domain ep'r, & extremes.

(59) $\dfrac{x^{2/3}(x+2)}{x^{2/3}}$ Domain = $\mathbb{R}$

$= x^{5/3} + 2x^{2/3}$

$y' = \frac{5}{3}x^{\frac{2}{3}} + \frac{4}{3}x^{-\frac{1}{3}} = \frac{1}{3}x^{-\frac{1}{3}}[5x+4]$

$\frac{x^{\frac{1}{3}}}{x^{\frac{1}{3}}} \cdot \frac{5x^{2/3}}{3} + \frac{4}{3x^{1/3}} = \frac{5x+4}{3x^{1/3}}$

cps: $5x+4=0 \Rightarrow x = -\frac{4}{5}$

$3x^{\frac{1}{3}} = 0 \Rightarrow x = 0$

$f(-\frac{4}{5}) = (-\frac{4}{5})^{2/3}(-\frac{4}{5}+2) = (-\frac{4}{5})^{2/3}(\frac{6}{5})$

$f(0) = 0$

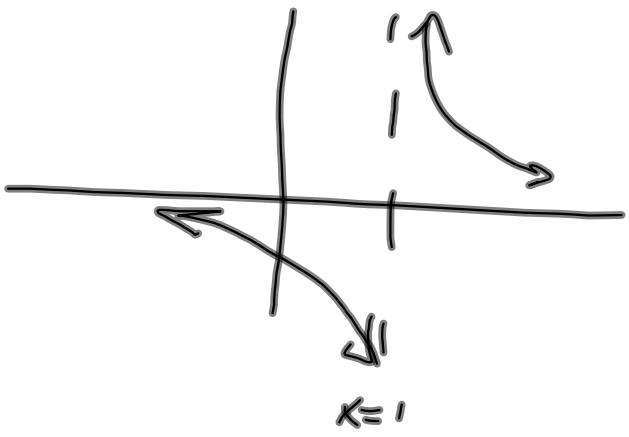
$\frac{2}{3} = (\frac{1}{3})(2)$

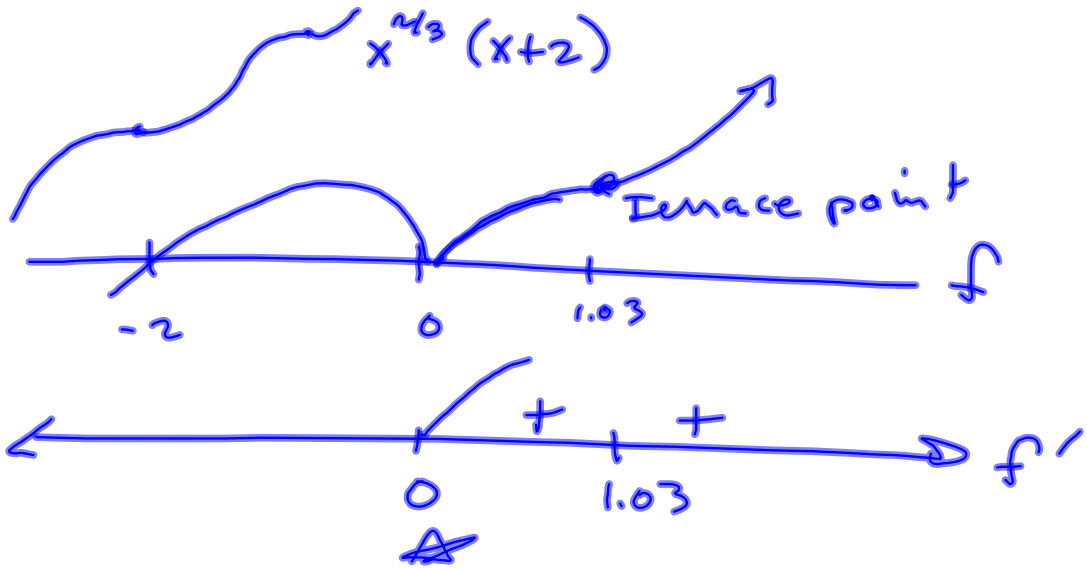
$((-\frac{4}{5})^{\frac{1}{3}})^2$

Local max $(-\frac{4}{5}, (-\frac{4}{5})^{2/3}(\frac{6}{5}))$

Local min $(0, 0)$

$\frac{1}{x-1}$ on $[-2, 4]$





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