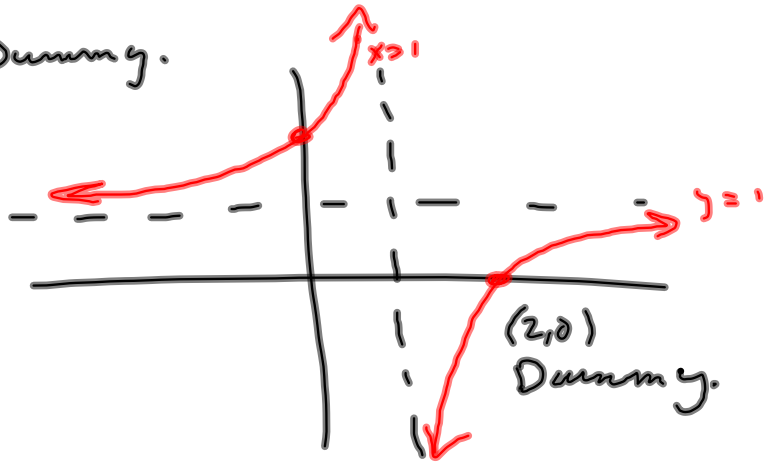
$$\frac{x^3+2}{x^3-1} = \frac{(x+2)(x^2-2x+4)}{(x-1)(x^2+x+1)}$$

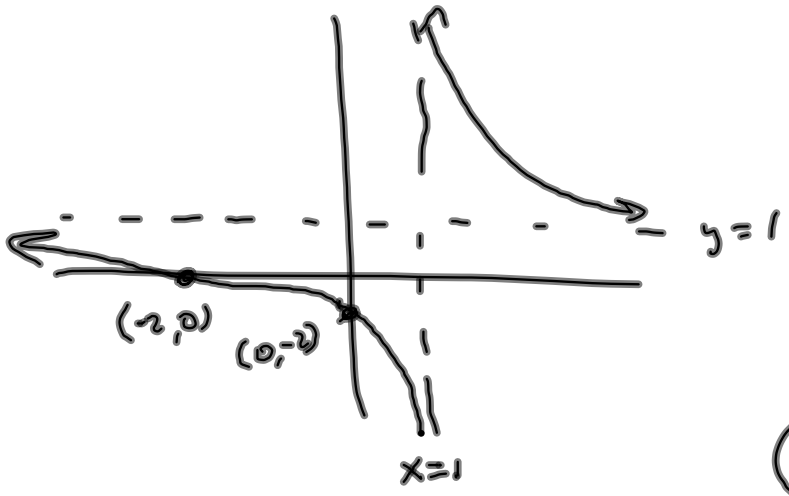
zeros: $x=-2$ → Dummy.

V.A.: $x=1$

H.A.: $y=1$



$$f'(x) = -9\frac{x^2}{(x^3-1)^2}$$

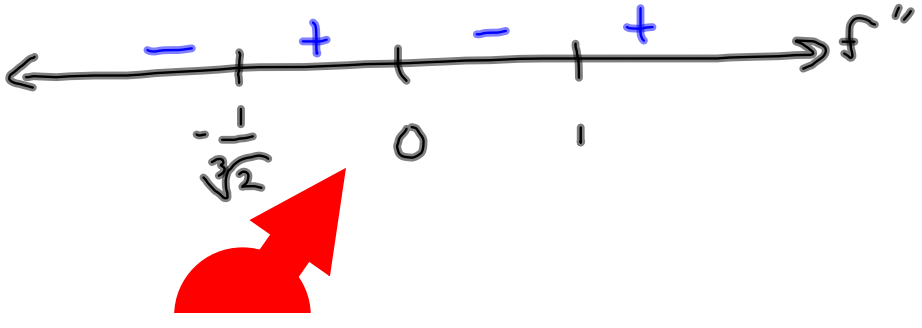


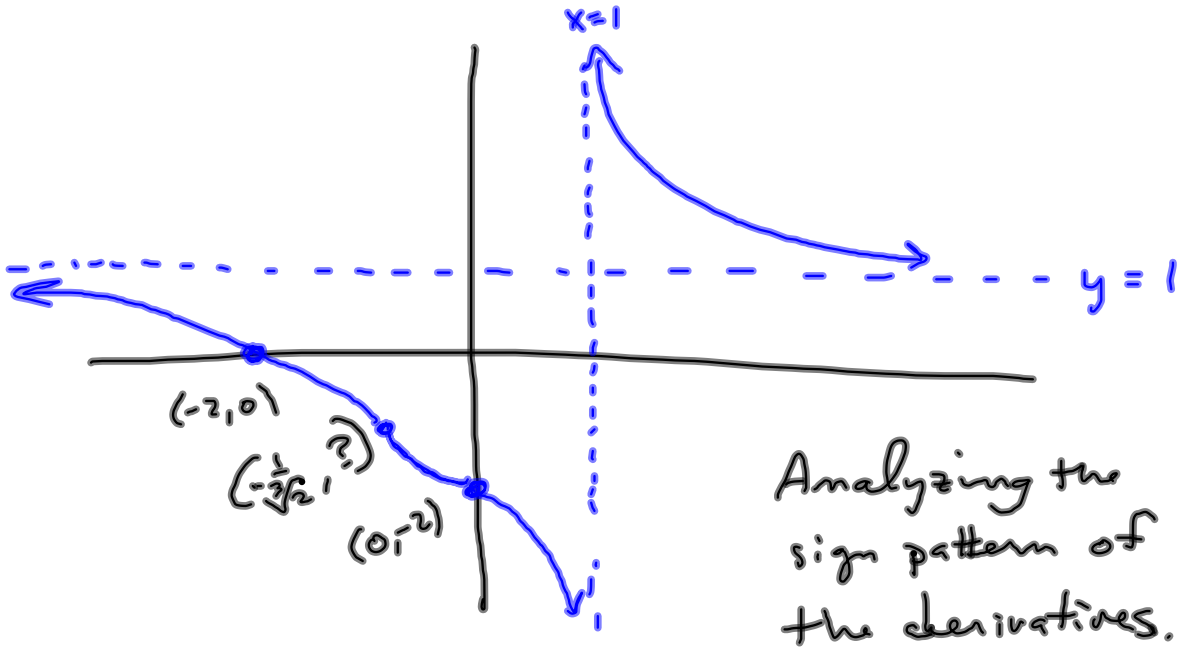
No calc.

$$f'(x) = -9\frac{x^2}{(x^3-1)^2}$$

$(\sqrt[3]{2}x)^3 + 1^3$ is negative, except @ $x=0$, where $f'(x)=0$

$$f''(x) = 18\frac{x(2x^3+1)}{(x^3-1)^3} = 18\frac{x(\sqrt[3]{2}x+1)((\sqrt[3]{2}x)^2-\sqrt[3]{2}x+x^2)}{(x-1)^3(x^2+x+1)^3}$$




x=1
y=1
(-2,0)
(0,-2)
Analyzing the sign pattern of the derivatives.

$\frac{3x^3+2x^2-5}{x^2+3x+1}$

$y = 3x-7$ is oblique asymptote

$$x^2+3x+1 \;\overline{)\; 3x^3+2x^2+0x+1}$$

$3x-7$

$-(3x^3+9x^2+3x)$

$-7x^2$

$\frac{3x^3+2x^2-5}{x+7}$

$$x+7 \;\overline{)\; 3x^3+2x^2+0x-5}$$

$3x^2-19x+133+\frac{?}{x+7}$

$-(3x^3+21x^2)$

$-19x^2+0x-5$

$-(-19x^2-133x)$

$+133x-5$

$y = 3x^2-19x+133$ is the O.A.

§ 4.6 #2

$f(x) = x^6 - 15x^5 + 75x^4 - 125x^3 - x$

$f'(x) = 6x^5 - 75x^4 + 300x^3 - 375x^2 - 1$

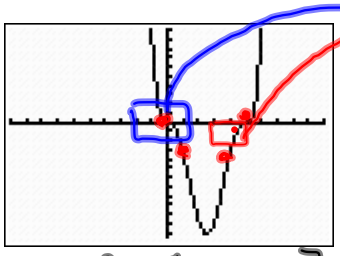
$f''(x) = 30x^4 - 300x^3 + 900x^2 - 750x$

(0,0) right off

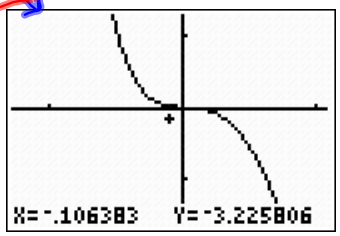
Quick Graphs:

f(x): E.B. ↖ ... ↗

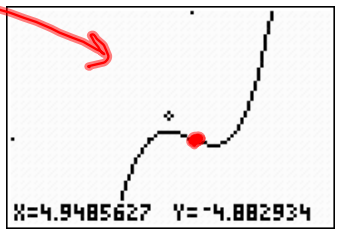
Max # of extremes: 5

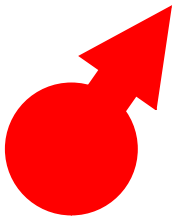


[-10,10] x [-250,200]

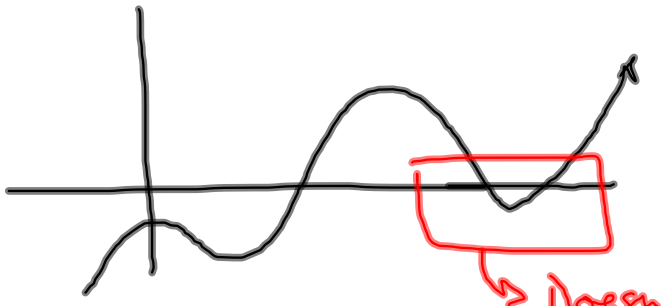


[-1.3, 1.1] x [-32.3, 25.8]

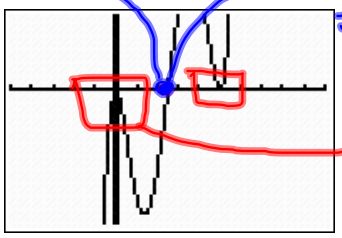


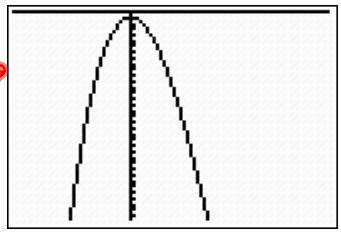


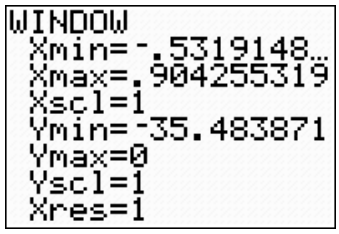
Quick graph of $f'(x)$



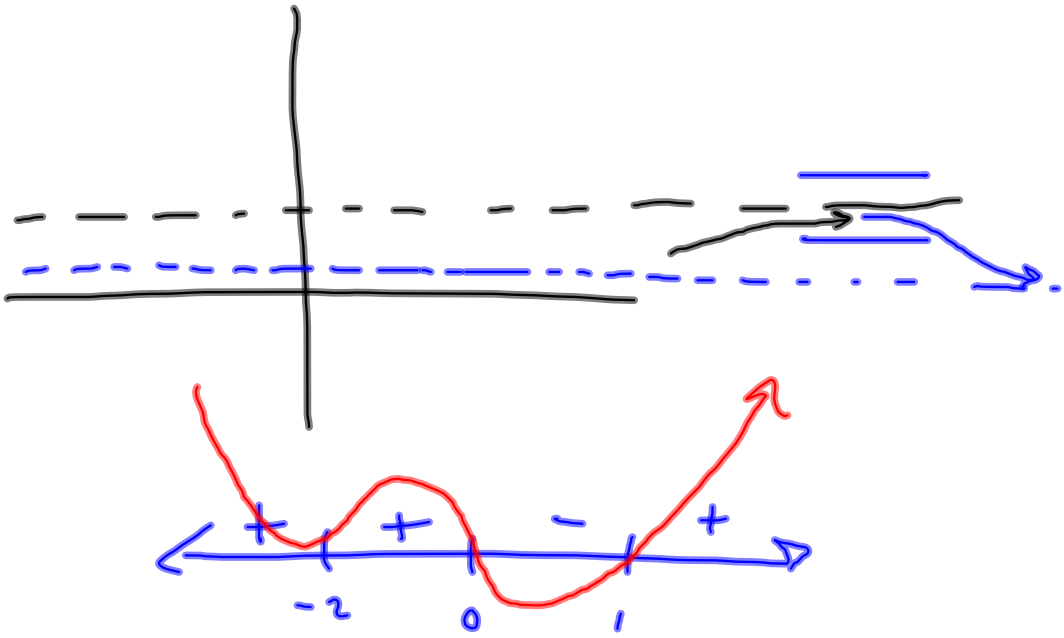
Doesn't show up if you're tall enough to catch the big stuff.







Mar 21-12:51 PM



Mar 21-1:01 PM