Asymptotes

Vertical

$\lim_{x \to \#} f(x) = \pm\infty$

↑ Denom = 0

Horizontal

$\lim_{x \to \pm\infty} f(x) = \#$

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

Slant – numerator is one power higher than the denom

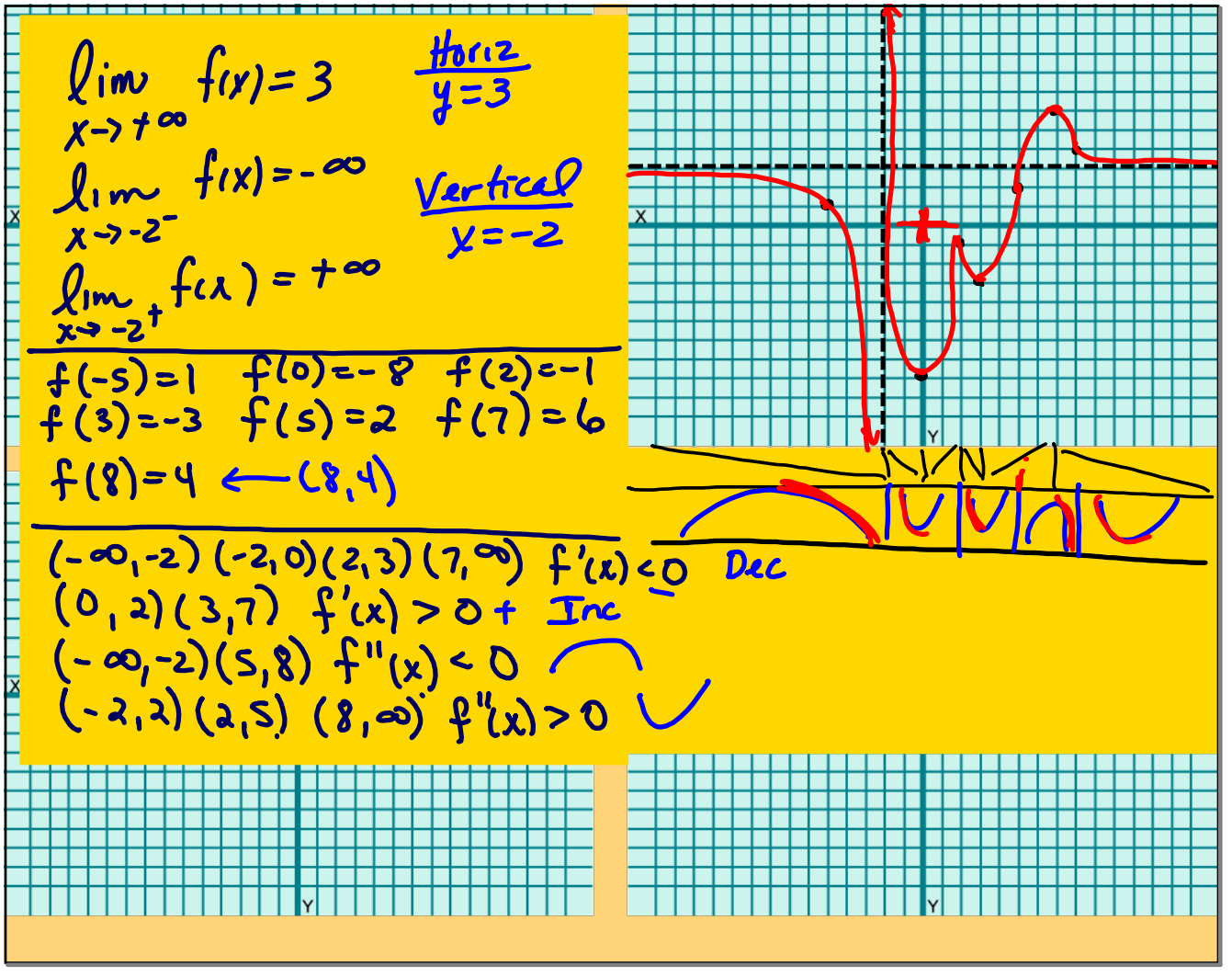
Curvilinear – numerator is two or more powers higher than the denom

Find with long division

$$\begin{array}{r|l} & 2x - \frac{5}{2} \\ \hline 2x^2 + x - 3 & 4x^3 - 3x^2 + 0x - 5 \\ & -4x^3 - 2x^2 + 6x \\ \hline & -5x^2 + 6x - 5 \\ & -5x^2 \end{array}$$

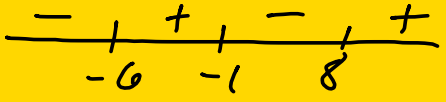
$y = 2x - 5/2$

November 17, 2022



Crit pts where $f'(x)=0$

Crit pts = $-6, -1, 8$

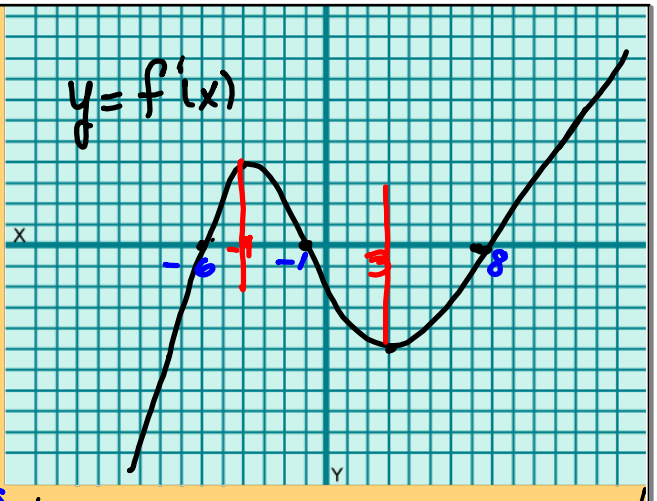


Inc/Dec Inc $f'(x)>0$ +
Dec $f'(x)<0$ −

→ where f' is above/below x-axis

Inc $(-6,-1)\ (8,\infty)$
Dec $(-\infty,-6)\ (-1,8)$

Rel Max/Min



Concavity
Infl Pts. are the rel max/min on the f'

→ Where graph of f' is inc/dec.

Concave Up $(-\infty,-4)\ (3,\infty)$

Concave Down $(-4,3)$

November 17, 2022