Asymptotes

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

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

Slant – numerator is one power higher than denominator.

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

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

$$\lim_{x \to \infty} \frac{4x^3}{2x^2}$$

$$\lim_{x \to \infty} 2x = \infty$$

Long Division

$$2x^2 + x + 3 \;\overline{)\; 4x^3 - 3x^2 + 0x - 5}$$

$2x - 5/2$

$-(4x^3 + 2x^2 + 6x)$

$-5x^2 - 6x - 5$

$$2 \cdot \frac{-5}{2} = -5$$

$$\boxed{y = 2x - 5/2}$$

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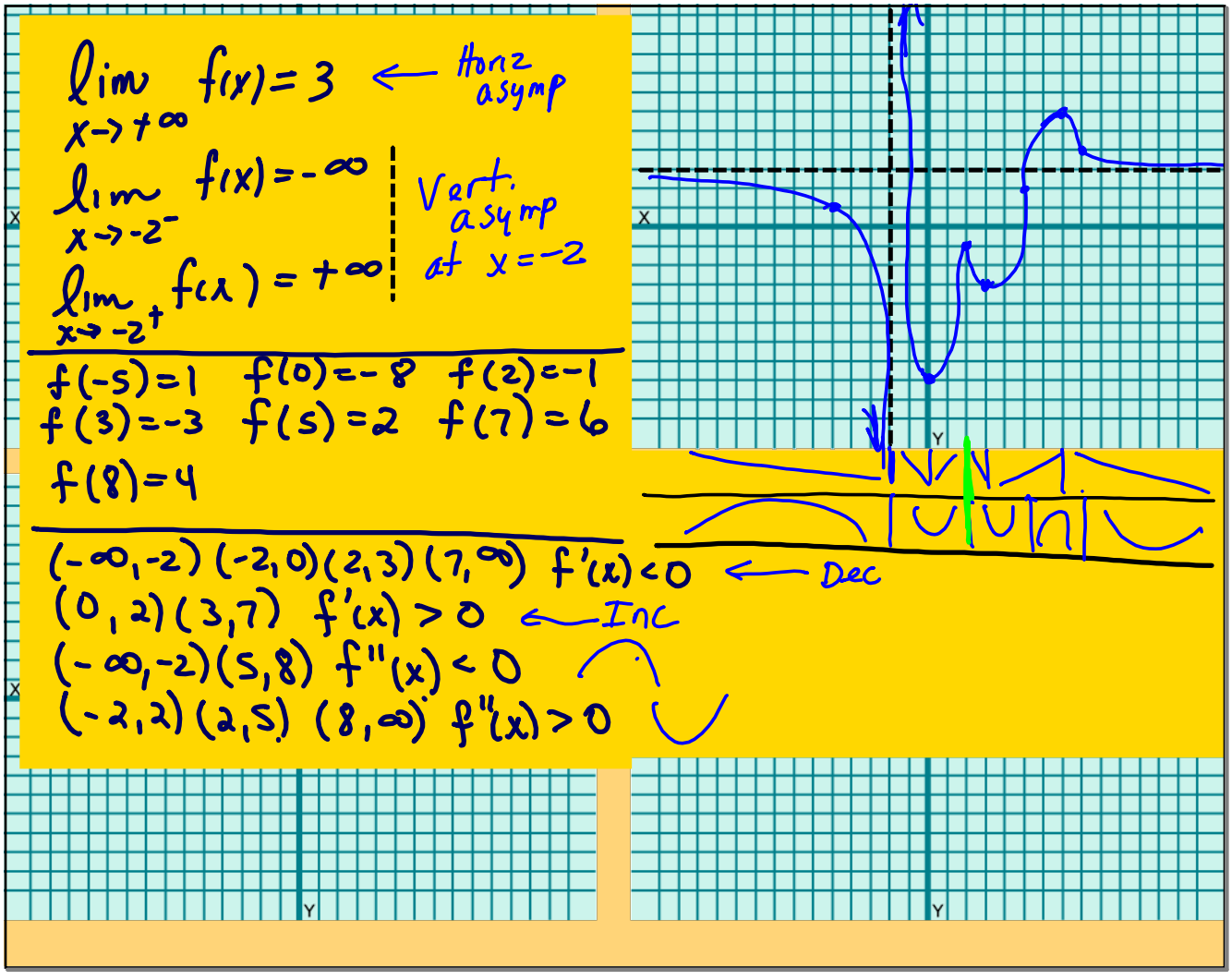


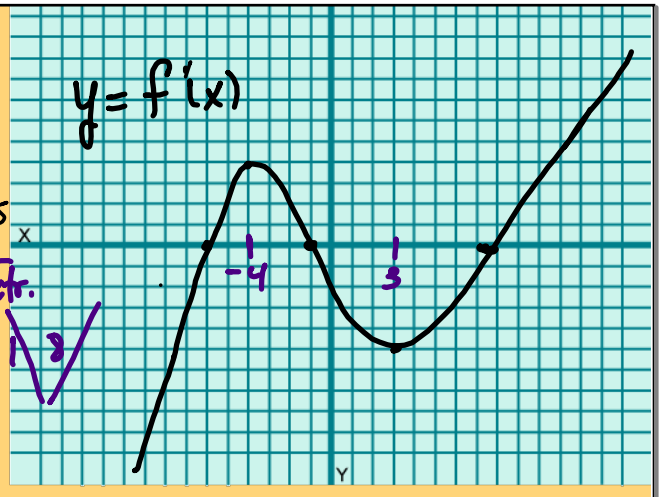
Critical points
$f'(x) = 0$
$-6, -1, 8$

Above/below x-axis

$- \mid + \mid - \mid +$
$-6 \quad -1 \quad 8$

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

Rel. Extr.
-6 -1 8



Infl pts. of orig. – where f' at rel max/min

Infl: $x = -4, 3$

$- \mid + \mid -$
$-4 \quad 3$

Concave up $(-4,3)$
Concave down $(-\infty,-4)(3,\infty)$

Concavity – where f' is inc/dec.

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