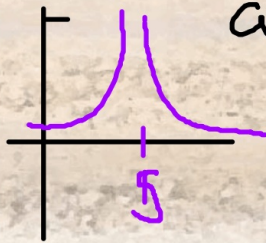


Wednesday, September 4

What is the difference
between the two limits below:

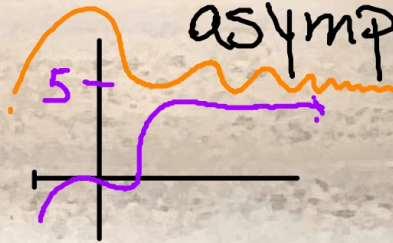
$$\lim_{x \rightarrow 5} f(x) = \infty$$

vertical
asymptote



$$\lim_{x \rightarrow \infty} f(x) = 5$$

horizontal
asymptote



September 4 - Day 3

Students will verbally explain how to
find the limit analytically, graphically
and numerically

(using the words:

evaluate, simplify, right, left, positive, negative,
infinity, sweeping away the crumbs...)

#7

$$7) \lim_{x \rightarrow 3^-} -\frac{4x}{x-3} = -\left(\frac{12}{-0}\right) = +\infty$$

less than 3

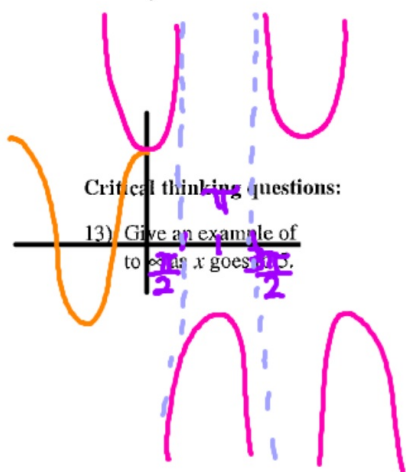
$$2-3 = -1$$

#9

$$9) \lim_{x \rightarrow -2^-} \frac{x+2}{x^2+x-2} = \frac{(x+2)}{(x+2)(x-1)}$$

$$\lim_{x \rightarrow -2^-} \frac{1}{x-1}$$

$$11) \lim_{x \rightarrow \frac{\pi}{4}} 2\sec(2x) = +\infty$$



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

$$\cos\left(2 \cdot \frac{\pi}{4}\right) = \cos\left(\frac{\pi}{2}\right) = 0$$

$$\cos\left(2 \cdot \frac{\pi}{8}\right) = \cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

$$\lim_{x \rightarrow -3^-} \frac{2x^2 + 7x + 3}{x + 3} = \frac{10}{-3+3} = \frac{10}{0}$$

$$= \frac{10}{-4+3} = \frac{10}{-1} \Rightarrow -\infty$$

$$-x^2 \quad (-x)^2$$

$$\lim_{x \rightarrow -4^+} \frac{-x^2 - 16}{x + 4} = \frac{-16 - 16}{-4 + 4} = \frac{-32}{0}$$

$$= \frac{-32}{-3 + 4} = \frac{-32}{+1} \Rightarrow -\infty$$

$$\lim_{x \rightarrow 1^+} \frac{-2x^2 + 5x + 3}{x - 1} = \frac{-2(1)^2 + 5(1) + 3}{1 - 1} = \frac{6}{0}$$

$$= \frac{-2(2)^2 + 5(2) + 3}{2 - 1} = \frac{5}{1} \Rightarrow +\infty$$