Find the limit as x approaches a number

14A) $\lim_{x \to -2^+} \frac{x}{x+2} =$ 14B) $\lim_{x \to -2^-} \frac{x}{x+2} =$ 14C) $\lim_{x \to -2} \frac{x}{x+2} =$

Using the limits found above graph $f(x) = \frac{x}{x+2}$

Vertical Asy.

denominator = 0

Find the vertical asymptotes of the graph and then describe the behavior to ~~the left and right of the~~ vertical asymptote

limit

30. $f(x) = \frac{1-x}{2x^2-5x-3}$

$2x^2-5x-3=0$

$(2x+1)(x-3)=0$

$2x+1=0$ $x-3=0$

$x=-\frac{1}{2}$ $x=3$

$\lim_{x \to -\frac{1}{2}^-} f(x) = \infty$

$\lim_{x \to -\frac{1}{2}^+} f(x) = -\infty$

$\lim_{x \to 3^-} f(x) = \infty$

$\lim_{x \to 3^+} f(x) = -\infty$

$x=-1$ $y=\frac{2}{4}$

$x=0$ $y=\frac{1}{-3}$

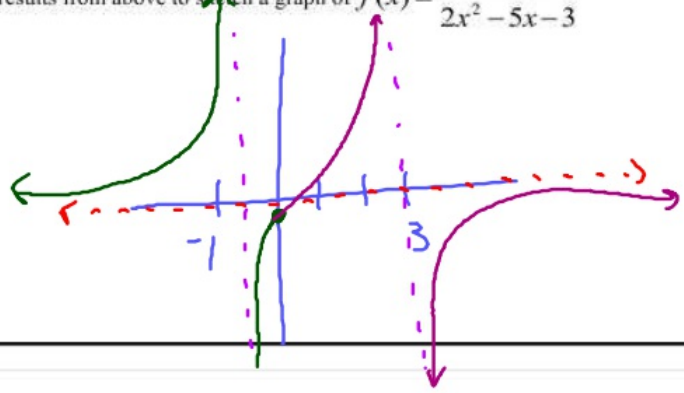
$x=2$ $y=\frac{-1}{-5}$

$x=4$ $y=\frac{-3}{9}$

Horizontal asy:

$\lim_{x \to \pm\infty} f(x) = 0$

Use your results from above to sketch a graph of $f(x) = \frac{1-x}{2x^2-5x-3}$



Find the limit of the functions that involve e^x

3. $\lim_{x\to\infty} \frac{e^{-x}}{x}$

$\lim_{x\to\infty} \frac{1}{xe^x} = 0$

$\lim_{x\to-\infty} \frac{e^{-x}}{x} = -\infty$

A) $\lim_{x\to\infty} \frac{e^x+2x}{2x} = \infty$

$\lim_{x\to\infty} \left(\frac{e^x}{2x}\right) + \left(\frac{2x}{2x}\right)$

$\infty + 1$

B) $\lim_{x\to-\infty} \frac{e^x+2x}{2x} = 1$

$\lim_{x\to-\infty} \left(\frac{e^x}{2x} + 1\right)$

$(0 + 1)$

Find the limit of the functions that involve sine and cosine

C) $\boxed{\lim_{x\to-\infty} \frac{x^3 + \cos x}{x^3} = 1}$

$\lim_{x\to-\infty} \left(\frac{x^3}{x^3} + \frac{\cos x}{x^3}\right)$

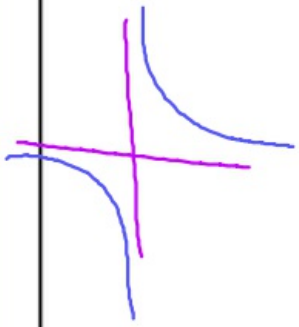
$(1 + 0)$

D) $\boxed{\lim_{x\to+\infty} \frac{x^3 + \cos x}{x^3} = 1}$

$\lim_{x\to\infty} \left(\frac{x^3}{x^3} + \frac{\cos x}{x^3}\right)$

$(1 + 0)$

$y = \frac{1}{x}$



E) $\lim_{x\to\infty} \sin\left(\frac{1}{x}\right)$

$\lim_{x\to\infty} \sin\left(\frac{1}{x}\right) \Rightarrow \sin(0) = 0$

angle approaches 0

F) $\lim_{x\to\infty} \frac{\sin\left(\frac{1}{x}\right)}{1+\left(\frac{1}{x}\right)} = \frac{0}{1+0} = 0$

Find the limit of the functions that involve absolute value

8A) $\lim_{x\to\infty} \frac{5x-2}{|x|-1} = 5$

8B) $\lim_{x\to-\infty} \frac{5x-2}{|x|-1} = -5$