Evaluate the following limits. Write "DNE" if a limit does not exist. **SCORE: _____ / 8 PTS**

You do not need to show the use of the limit laws. However, it must be clear how you got your answers.

[a] $\lim_{m \to -1} \frac{5+5m}{\sqrt{2m+3}+m}$ $\frac{0}{0}$

$= \boxed{\lim_{m \to -1} \frac{5(1+m)(\sqrt{2m+3}-m)}{2m+3-m^2}}$ 1

$= \boxed{\lim_{m \to -1} \frac{5(1+m)(\sqrt{2m+3}-m)}{(1+m)(3-m)}}$ $\frac{1}{2}$

$= \frac{5(\sqrt{1}--1)}{3--1}$

$= \frac{5(2)}{4_2}$

$= \boxed{\frac{5}{2}}$ $\frac{1}{2}$

[b] $\lim_{p \to 3} \frac{p^2-9}{\frac{5}{p+2}-\frac{2}{p-1}}$ $\frac{0}{0}$

$= \boxed{\lim_{p \to 3} \frac{(p+3)(p-3)(p+2)(p-1)}{5(p-1)-2(p+2)}}$ 1

$= \lim_{p \to 3} \frac{(p+3)(p-3)(p+2)(p-1)}{3p-9}$

$= \boxed{\lim_{p \to 3} \frac{(p+3)\cancel{(p-3)}(p+2)(p-1)}{3\cancel{(p-3)}}}$ $\frac{1}{2}$

$= \frac{\overset{2}{\cancel{6}}(5)(2)}{\cancel{3}}$

$= \boxed{20}$ $\frac{1}{2}$

[c] $\lim_{a \to 2} \frac{a^2-3a-2}{2a^2-5a-2}$

$= \frac{4-6-2}{8-10-2}$

$= \boxed{\frac{-4}{-4}}$ $\frac{1}{2}$

$= \boxed{1}$ $\frac{1}{2}$

[d] $\lim_{x \to -3} f(x)$ where $f(x) = \begin{cases} 2x+2, & \text{if } x < -3 \\ x-1, & \text{if } -3 < x < 3 \\ 5-x, & \text{if } x > 3 \end{cases}$

1 $\boxed{\lim_{x \to -3^+} (x-1)} = -3-1 = \boxed{-4}$

1 $\boxed{\lim_{x \to -3^-} (2x+2)} = -6+2 = \boxed{-4}$ $\frac{1}{2}$

$\frac{1}{2}$ $\boxed{\lim_{x \to 3} f(x) = -4}$

SUBTRACT $\frac{1}{2}$
FOR EACH ADDITIONAL
UNNECESSARY ONE SIDED
LIMIT YOU FOUND
eg. $\lim_{x \to -3^-} (5-x) = 8$

Sketch the graph of an example of a function that satisfies all the following conditions. **SCORE: _____ / 2 PTS**

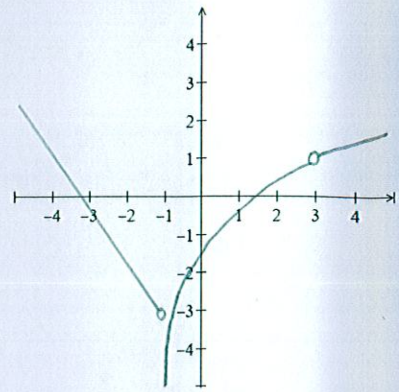
$\lim_{x \to -1^-} f(x) = -3$

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

$\lim_{x \to 3} f(x) = 1$

$f(3)$ does not exist

GRADED BY ME



The graph of f is shown on the right. Evaluate the following limits. Write "DNE" if a limit does not exist. **SCORE: _____ / 3 PTS**

[a] $\lim_{x \to 1} \frac{5x}{1 - f(x)}$ ← **<u>Show the proper use of limit laws to find your anwer.</u>**

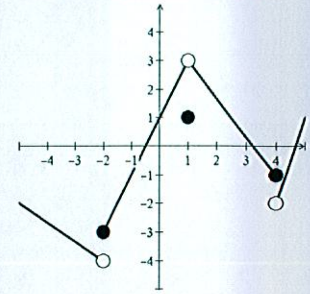
$= \boxed{\frac{(\lim_{x\to 1} 5)(\lim_{x\to 1} x)}{(\lim_{x\to 1} 1) - \lim_{x\to 1} f(x)}}$ (1)

$= \frac{5(1)}{1-3}$

$= \boxed{\frac{-5}{2}}$ (1)

[b] $\lim_{x \to -2^+} f(x)$

$= \boxed{-3}$ (1)



Prove that $\lim_{x \to 0} xe^{\cos\frac{1}{x}} = 0$. **SCORE: _____ / 4 PTS**

(1) $-1 \le \cos\frac{1}{x} \le 1$

($\frac{1}{2}$) $e^{-1} \le e^{\cos\frac{1}{x}} \le e$

($\frac{1}{2}$) $\frac{x}{e} \le xe^{\cos\frac{1}{x}} \le ex$

(1) $\lim_{x\to 0} \frac{x}{e} = 0$ AND $\lim_{x\to 0} ex = 0$

SO BY SQUEEZE THEOREM, $\lim_{x\to 0} xe^{\cos\frac{1}{x}} = 0$

(1)

SUBTRACT ($\frac{1}{2}$) IF YOU FORGOT TO STATE THE CONCLUSION