PrepaTec

CALCULUS I

Quiz # 1B 80

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1. Estimate the given limit using a numerical approximation (15 pts)

$$\lim_{x \to 0} \frac{\sqrt{x+1}-1}{x}$$

x	−0.1	−0.01	−0.001	0	0.001	0.01	0.1
$f(x)$	.51316	.50125	.50012	/	.4998	.4987	0.488

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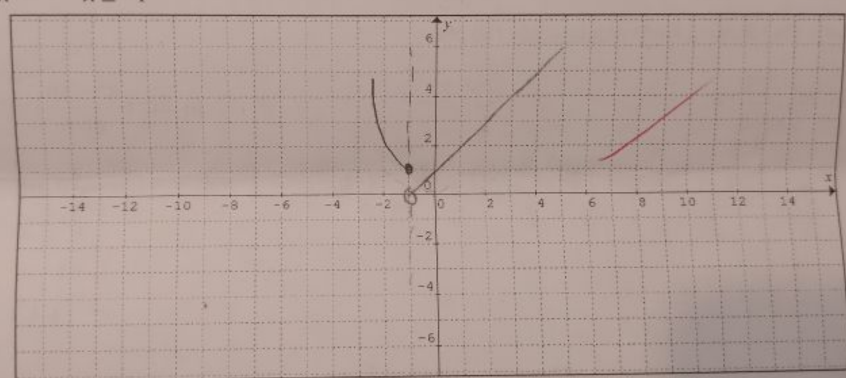
2. Graph the following functions and find their limits.

$$f(x)=\begin{cases} x+1 & x>-1 \\ x^2 & x\le -1 \end{cases}$$ (15 pts).



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Find (20 pts)

a) $\lim_{x\to -1^+} f(x)$ 0

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

c) $\lim_{x\to -1} f(x)$ $\nexists$

d) $f(-1)$ $\nexists$ 1

x

15

3. Based on the graph find the limits (20 pts)

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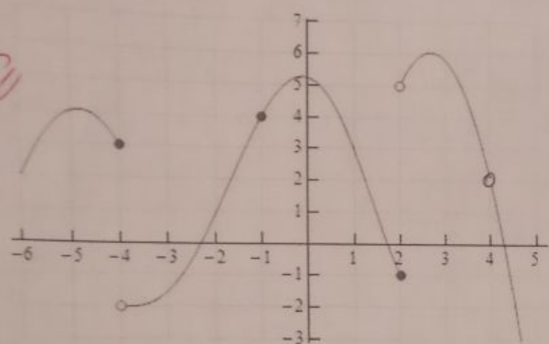

a) $\lim_{x \to -4^-} f(x)$ ___-2___ b) $\lim_{x \to 2^-} f(x)$ ___-1___

c) $\lim_{x \to 4} f(x)$ ___2___ d) $f(4)$ ___(4, 2) ∄ hole!___

× ∄ hole!!

4. Evaluate the following limits algebraically (30 pts):

a) $\lim_{x \to 25} \left(\frac{x-25}{\sqrt{x}-5}\right) =$

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$\frac{x-25}{\sqrt{x}-5}\left(\frac{\sqrt{x}+5}{\sqrt{x}+5}\right) \quad \frac{25x+5x-25\sqrt{x}-125}{x+5\sqrt{x}-5\sqrt{x}-25}$

$\frac{\cancel{x-25}(\sqrt{x}+5)}{\cancel{x-25}}$

$\sqrt{x}+5 = \sqrt{25}+5 = 5+5$

$= 10$

$\cancel{\sqrt{x} = -5}$

$\cancel{x = -5^2}$

$\cancel{\boxed{x = 25}}$

$\sqrt{x}+5 =$

$\sqrt{25}+5 = 5+5 = \boxed{10}$

b) $\lim_{x \to 6} \left(\frac{x^2-36}{x-6}\right) = \frac{(x+6)\cancel{(x-6)}}{\cancel{x-6}}$

$x+6 = 6+6 = 12$

$\cancel{x+6}$

$x+6 = 6+6 = \boxed{12}$

PrepaTec CALCULUS I Quiz # 2A

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Find the following limits (8 pts each)

a) $\lim_{x\to 0} 8 = \boxed{8}$

b) $\lim_{x\to e} \ln x = \ln e = \boxed{1}$

c) $\lim_{x\to \pi/4} \dfrac{\operatorname{sen} x}{2} = \dfrac{\operatorname{sen} \pi/4}{2} = \dfrac{0.01370}{2} = \boxed{0.00685}$

d) $\lim_{x\to -3} \dfrac{x^2 - x + 12}{x+3} = \dfrac{(-3)^2 - 3 + 12}{-3+3} = \dfrac{24}{0} = \boxed{0}$

$\dfrac{(x-4)(x+3)}{x+3} = x - 4 = 3 + 4 = \boxed{7}$

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

f) $\lim_{h\to 0} \dfrac{(h-3)^2 - 9}{h} \quad \dfrac{(0-3)^2 - 9}{0} = \dfrac{0}{0} = \boxed{0}$

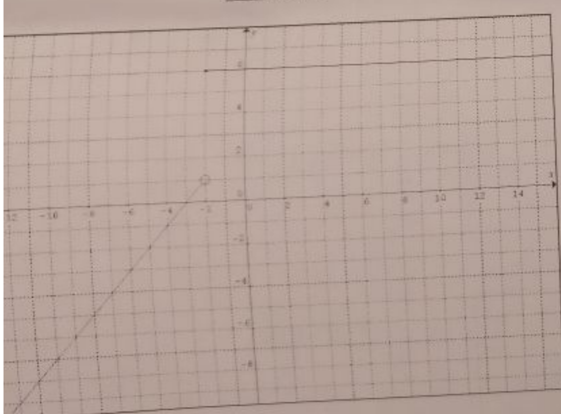
g) $\lim_{x\to 4} \dfrac{4-x}{2-\sqrt{x}} \quad \dfrac{4-4}{2-\sqrt{4}} = \dfrac{0}{2-2} = \dfrac{0}{0} = \boxed{0}$

f) $\dfrac{(h-3)^2 - 9}{h} = \dfrac{h^2 - 6h}{h} = \dfrac{h(h-6)}{h}$

g) $\dfrac{4-x}{2-\sqrt{x}}\left(\dfrac{2+\sqrt{x}}{2+\sqrt{x}}\right) = \dfrac{(4-x)(2+\sqrt{x})}{4-x} = 2+\sqrt{x}$

Based on the given graphs of functions determine the limits (4 pts each)

Function 1



a) $\lim_{x\to -2} f(x) = 1$

b) $\lim_{x\to 4} f(x) = 6$

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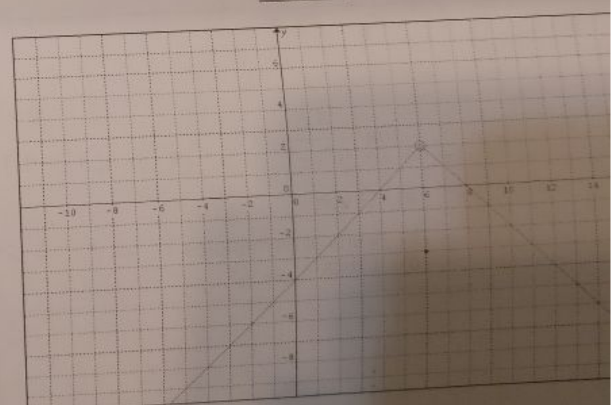
Function 2



a) $\lim_{x\to 0} f(x) = -4$

b) $\lim_{x\to 6} f(x) = 2$

Using the following functions find (28 pts)

1- $\lim_{x \to -1^+} \frac{x-2}{x+1}$ $x=-1$

a) Graph
b) Vertical asymptotes $x=-1$
c) Limits $= \infty$

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2- $\lim_{x \to -3^-} \frac{4x}{9-x^2} = \frac{4x}{-x^2+9} = -(x^2-9) = -(x+3)(x-3)$ $x=3$ $x=-3$

a) Graph
b) Vertical asymptotes $x=3$ $x=-3$
c) Limits $= -\infty$

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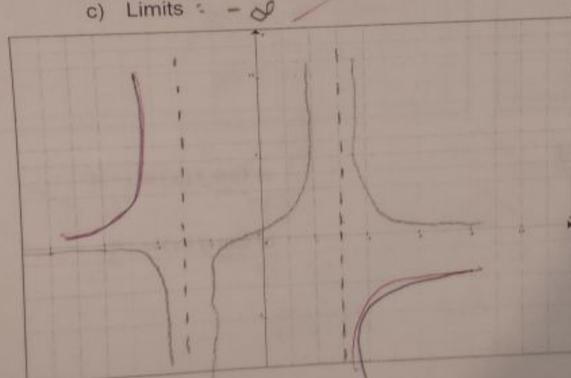

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