Practice Problems In-class 1.2-1.3 Quiz Review

1) $\lim_{x\to 3} \dfrac{\sqrt{25-x^2}-4}{x-3}$

$\lim_{x\to 3} \dfrac{\sqrt{25-x^2}-4}{x-3} = \dfrac{0}{0}$

$$\lim_{x\to 3} \frac{\left(\sqrt{25-x^2}-4\right)}{x-3} \cdot \frac{\left(\sqrt{25-x^2}+4\right)}{\sqrt{25-x^2}+4} = \lim_{x\to 3} \frac{25-x^2-16}{(x-3)\left(\sqrt{25-x^2}+4\right)}$$

$$\lim_{x\to 3} \frac{9-x^2}{(x-3)\left(\sqrt{25-x^2}+4\right)} = \lim_{x\to 3} \frac{(3-x)(3+x)}{(x-3)\left(\sqrt{25-x^2}+4\right)} = \lim_{x\to 3} \frac{-(x-3)(3+x)}{(x-3)\left(\sqrt{25-x^2}+4\right)}$$

$$= \frac{-6}{\sqrt{16}+4} = \frac{-6}{8} = \boxed{\frac{-3}{4}}$$

2) $\lim_{x\to 0} \dfrac{\frac{1}{x+1}-1}{x}$

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

$\lim_{x\to 0} \dfrac{\frac{1-(x+1)}{x+1}}{x}$

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

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

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

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

3)

x	-5.1	-5.01	-5.001	-5.0001	-5	-4.9999	-4.999	-4.99	-4.9
f(x)	12.1	12.35	12.66	12.89	und	13.06	13.14	13.86	13.89

Find $\lim_{x \to -5} f(x) =$ _____