Math 340 - ARC Quiz 4
Lui Name

No notes or calculators. Show all work.

1. (4 points) Let $\lim_{x\to 5} f(x) = 8$ and $\lim_{x\to 5} g(x) = -2$. Find the limit and simplify.

$$\lim_{x\to 5} \frac{4 * f(x) - g(x)}{2^{g(x)}}$$

$$= \frac{4 \cdot \lim_{x\to 5} f(x) - \lim_{x\to 5} g(x)}{2^{\lim_{x\to 5} g(x)}}$$

$$= \frac{4(8) - (-2)}{2^{-2}} = \frac{32+2}{\frac{1}{4}} = 34 \cdot 4 = 136$$

2. (4 points) Find the limit.

$$\lim_{x\to 36} \frac{\sqrt{x}-6}{x-36}$$

$\boxed{\text{D. S. } \frac{0}{0}}$

Two ways

$$\lim_{x\to 36} \frac{(\sqrt{x}-6)(\sqrt{x}+6)}{(x-36)(\sqrt{x}+6)}$$

$$= \lim_{x\to 36} \frac{\cancel{(x-36)}}{\cancel{(x-36)}(\sqrt{x}+6)} = \lim_{x\to 36} \frac{1}{\sqrt{x}+6} = \boxed{\frac{1}{12}}$$

$$\lim_{x\to 36} \frac{(\sqrt{x}-6)}{(\sqrt{x}-6)(\sqrt{x}+6)}$$

$$\lim_{x\to 36} \frac{1}{\sqrt{x}+6}$$

$$= \boxed{\frac{1}{12}}$$

3. (2 points) State the interval(s) on which the function is continuous.

$$f(x) = \frac{x^2+x}{(x+8)(x-3)}$$

f(x) is discontinuous at $x=-8$, and $x=3$

otherwise, f(x) is continuous everywhere

Intervals: $(-\infty,-8) \cup (-8,3) \cup (3,\infty)$

$\hookrightarrow$ Note, this is the domain of f(x)