

Limit problems from Exam 1 and Exam 4:

1. Find  $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x - 2}$ .

2. Find  $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$ .

3. Find  $\lim_{x \rightarrow 3^-} \frac{x - 5}{(x - 3)(x - 1)}$ .

4.  $\lim_{x \rightarrow 5} \frac{x^2 - x - 20}{x - 5}$ .

5. Find  $\lim_{x \rightarrow 5^+} \frac{\sqrt{x + 4} - 4}{x - 5}$ .

6.  $\lim_{x \rightarrow 5} \frac{\sqrt{x + 4} - 3}{x - 5}$ .

7. Let  $f(x) = \frac{x\sqrt{3x^2 + 5}}{(2x + 1)^2}$ .

(a) Find  $\lim_{x \rightarrow \infty} f(x)$ .

(b) Find  $\lim_{x \rightarrow -\infty} f(x)$ .

(c) Find  $\lim_{x \rightarrow -\frac{1}{2}^+} f(x)$ .

8. Let  $f(x) = \frac{2x^3 + 4}{|x|(3x - 1)^2}$ .

(a) Find  $\lim_{x \rightarrow \infty} f(x)$ .

(b) Find  $\lim_{x \rightarrow -\infty} f(x)$ .

(c) Find  $\lim_{x \rightarrow 0^-} f(x)$ .

9. Find  $\lim_{x \rightarrow \infty} \frac{1}{\sqrt{x^2 + x} - x}$ .