

Show all work and simplify all answers before circling/boxing them. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

Due next class. Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. Evaluate $\lim_{x \rightarrow 3} (4x - 5)$

2. Evaluate $\lim_{y \rightarrow -3} (5 - y)^{4/3}$

3. Evaluate $\lim_{x \rightarrow 2} \frac{3x^2 - x - 10}{x^2 - 4}$

4. Evaluate $\lim_{x \rightarrow -2} \frac{-2x - 4}{x^3 + 2x^2}$

5. Evaluate $\lim_{x \rightarrow 6^-} \frac{|6 - x|}{6 - x}$

6. Evaluate $\lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x + 3} - 2}$

7. Evaluate the following limits for $f(x)$

$$f(x) = \begin{cases} x^2 - 3x + 4 & x \leq 1 \\ x + 1 & 1 < x \leq 3 \\ x^2 - 3x + 4 & x > 3 \end{cases}$$

(a) $\lim_{x \rightarrow 1^-} f(x)$

(d) $\lim_{x \rightarrow 3^-} f(x)$

(g) $\lim_{x \rightarrow -1} f(x)$

(b) $\lim_{x \rightarrow 1^+} f(x)$

(e) $\lim_{x \rightarrow 3^+} f(x)$

(h) $\lim_{x \rightarrow 0} f(x)$

(c) $\lim_{x \rightarrow 1} f(x)$

(f) $\lim_{x \rightarrow 3} f(x)$

(i) $\lim_{x \rightarrow 6} f(x)$

8. It can be shown that the inequalities

$$1 - \frac{x^2}{6} < \frac{x \sin x}{2 - 2 \cos x} < 1$$

hold for all values of x close to zero. What, if anything, does this tell you about

$$\lim_{x \rightarrow 0} \frac{x \sin x}{2 - 2 \cos x}?$$

Give reasons for your answer.