

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise. If you finish early, you may leave with my approval.

1. (0 points) Evaluate the following limits:

(a)  $\lim_{x \rightarrow 3} (4x - 5)$

(b)  $\lim_{x \rightarrow 2} \frac{x + 3}{x + 6}$

(c)  $\lim_{y \rightarrow -3} (5 - y)^{4/3}$

(d)  $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x - 3}$

(e)  $\lim_{x \rightarrow -2} \frac{-2x - 4}{x^3 + 2x^2}$

(f)  $\lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x + 3} - 2}$

**2.** (*0 points*) 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.

**3.** (*0 points*) Find a  $\delta > 0$  such that for all  $x$  we have  $0 < |x - x_0| < \delta \Rightarrow |f(x) - L| < \epsilon$ :  
 $f(x) = \sqrt{19 - x}$ ,  $L = 3$ ,  $x_0 = 10$ ,  $\epsilon = 1$