College of the Holy Cross, Spring Semester, 2019
Math 134, Calculus 2 with Fundamentals
Calculus 1 Review Practice Exercises

1. Find the derivatives of the following functions.

   (a) $f(x) = 10x^3 - 4x^2 + 5x - 9$

   (b) $f(x) = x\sqrt{x} + \dfrac{2}{5x}$

   (c) $f(x) = \dfrac{2x - 7}{3x + 5}$

   (d) $f(x) = x^2 \sin(3x)$

   (e) $f(x) = \sqrt{1 - x^2}$

   (f) $f(x) = xe^{-x^2}$

   (g) $f(x) = \sin(xe^{3x})$

   (h) $f(x) = -\ln(\cos(x))$

   (i) $f(x) = \sin^2(x) + \cos^2(x)$

   (j) $f(x) = x \arctan(3x)$

   (k) $f(x) = \dfrac{2}{(2 + 3x)^3}$

2. Evaluate the following limits.

(a) $\lim_{x\to\infty} \dfrac{(x+1)(2x+3)}{x^2}$

(b) $\lim_{x\to\infty} \dfrac{(x+1)(2x+3)}{x^3}$

(c) $\lim_{x\to\infty} \dfrac{(x+1)(2x+3)}{x}$

(d) $\lim_{x\to\infty} \dfrac{\ln(x)}{x^2}$

(e) $\lim_{x\to\infty} xe^{2x}$

(f) $\lim_{x\to-\infty} xe^{2x}$

(g) $\lim_{x\to\infty} e^{-2x}\sin(3x)$

(h) $\lim_{x\to\infty} \dfrac{3e^{3x}+e^{2x}}{5e^{3x}-e^{x}}$