

You have 20 minutes to work on this individual activity. It will be graded while you complete the group activity and returned to you at the end of class. Please show all work.

Name: _____

1. Simplify or expand the following expressions.

(a) $(x + 2)^2$

(d) $\sqrt{x(x + 2) + 1}$

(b) $\frac{\sqrt{t}}{t} - \frac{1}{\sqrt{t}}$

(e) $\frac{\sin(2x)}{2} - \sin(x) \cos(x)$

(c) $\left(x + \frac{1}{\sqrt{t}}\right)^2$

(f) $\sqrt{\cos^2(x) + \sin^2(x)}$

2. Find the following limits or show the limit does not exist.

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

(b) $\lim_{x \rightarrow -\infty} \frac{\sqrt{9x^6 + 3x^3 + 4} - 7}{x^3 + 3}$

(c) $\lim_{x \rightarrow -3} \frac{|4x + 12|}{x + 3}$

3. Let $f(x) = x^5$ and $g(x) = 5^x$. Find the following derivatives.

(a) $f'(x)$

(b) $g'(x)$

(c) $(fg)'(x)$

(d) $(f/g)'(x)$

4. Find the tangent line to the curve $f(x) = \frac{x + \tan(x)}{x^2 - \cos(x)}$ at the point $x = 0$.