Name:_____

M242: Calculus I (Fall 2018)
Midterm Exam, part I

WICHITA STATE UNIVERSITY

Read and follow all instructions. You may not use any electronic devices.

Part I: Computations

Complete the following problems, showing enough work. Each problem is worth 5 points. Partial credit will be given when deserved.

1–3. Find the limits, provided they exist.

1. $\lim_{x\to 1^+} \dfrac{x-1}{\sqrt{x-1}}$

2. $\lim_{x\to 2} \dfrac{x^2+5x-14}{x^2-3x+2}$

3. $\lim_{x\to 0} \left(\dfrac{\sin(2x)}{x}\right)^3$

4–7. Compute the derivatives of the functions. Show enough work.

4. $f(x) = (x+1)^2(2x-1)$

5. $g(x) = \dfrac{x^2 - 2x}{\sqrt[3]{x}}$

6. $y = \sin\big(\tan(x^2)\big)$

7. $h(x) = \left(\dfrac{x}{x+1}\right)^2$

8. Find $\frac{dy}{dx}$ for the implicit function $x^2 + 6xy + y^2 = 0$.

9. Find an equation of the tangent line to the curve $y = \sec(x)$ at the point $\left(-\frac{\pi}{4}, \sqrt{2}\right)$.

10. Find all critical numbers of the function $y = x^3 - \frac{15}{2}x^2 + 18x - 100$.