1. Describe what is meant by a *tangent line*, and sketch an example of one

2. Find the limit \( \lim_{x \to -4} \frac{x^2 - 16}{x + 4} \)

3. Find the limit \( \lim_{x \to 0} \frac{\sqrt{x + 25} - 5}{x} \)

4. Find the limit \( \lim_{x \to 0} \frac{x^2 - 2x}{x^2 (x - 1)} \) and \( \lim_{x \to 0} \frac{x^2 - 2x}{x^2 (x - 1)} \)

5. Evaluate \( \lim_{x \to 3} \frac{x^2 - 9}{x - 3} \) by evaluating the limit from the right and left

6. Prove \( \lim_{x \to 3} (4x - 2) = 10 \) using the epsilon-delta definition of a limit

7. Sketch a function that has at least one removable discontinuity, and at least one infinite discontinuity and at least one jump discontinuity. Be sure to label the discontinuities

8. Prove that \( f(x) = x - \tan(x) \) has a root between \( x = 7.5 \) and 7.8

9. Find all asymptotes (horizontal and vertical) for \( f(x) = \frac{3x^2 + 2x - 5}{2x^2 - 4} \)

10. Find the slope of the tangent to the curve \( y = \frac{1}{x} + 1 \) at any point using the limit definition of derivative