

Indeterminate Forms and L'Hospital's Rule- HW Problems

Evaluate the following limits.

1.
$$\lim_{x \rightarrow 1} \frac{x^2 + 2x - 3}{x - 1}$$

2.
$$\lim_{x \rightarrow \infty} \frac{x^2 + 2x - 3}{2x^2 + 1}$$

3.
$$\lim_{x \rightarrow \infty} \frac{\ln(x^2)}{x}$$

4.
$$\lim_{x \rightarrow 0} \frac{\cos(x) - 1}{3x^2}$$

5.
$$\lim_{x \rightarrow 0} \frac{\tan^{-1}(2x)}{3x}$$

6.
$$\lim_{x \rightarrow \infty} x^2 e^{-x}$$

7.
$$\lim_{x \rightarrow 0^+} ([\sin(x)][\ln(x)])$$

8.
$$\lim_{x \rightarrow 0^+} \left(\frac{1}{x} - \frac{1}{e^x - 1} \right)$$

9.
$$\lim_{x \rightarrow 0^+} (1 + \tan(x))^{\frac{1}{x}}$$

10.
$$\lim_{x \rightarrow 0} (\cot(x) - \csc(x))$$

11.
$$\lim_{x \rightarrow 0^+} (\sin(4x))^x$$

12.
$$\lim_{x \rightarrow \infty} \left(\frac{1}{x} \right)^x$$

13.
$$\lim_{x \rightarrow \infty} (e^x + x)^{\left(\frac{9}{x} \right)}$$