

Name _____

• 20 minutes

• No calculators

• Show sufficient work

We will learn l'Hospital's Rule and other shortcuts for obtaining limits later. For now you are not allowed to use these approaches.

1. (2 points) Evaluate $\tan(\arcsin(2/3))$.

2. (2 points each) Evaluate the following limits. For infinite limits, you must clearly show whether the limit is ∞ or $-\infty$.

(a) $\lim_{x \rightarrow 2} \frac{x^2 - 3x + 2}{x^2 - 4}$

$$(b) \lim_{x \rightarrow 2} \frac{\sqrt{x^2 + 5} - 3}{x - 2}$$

$$(c) \lim_{x \rightarrow e^+} \frac{1 - \ln(\sqrt{x})}{1 - \ln(x)}$$

3. (2 points) Write an equation for each horizontal asymptote on the graph of the given function. Use limits to justify your answer.

$$f(x) = \frac{12e^{-x} + 35}{5 + 3e^{-x}}$$