

Name \_\_\_\_\_

- You have 20 minutes
- No calculators
- Show sufficient work

1. (3 points) Determine the equation for one of the horizontal asymptotes on the graph of

$$f(x) = \frac{1}{\sqrt{36x^2 + 3x - 6x}}$$

2. (1 point) Which one of the following equations must hold in order for a function  $g$  to be continuous at a number  $k$  ?

(a)  $\lim_{x \rightarrow \infty} g(x) = g(k)$

(b)  $\lim_{x \rightarrow \infty} g(x) = 0$

(c)  $\lim_{x \rightarrow \infty} g(x) = k$

(d)  $\lim_{x \rightarrow 0} g(x) = g(k)$

(e)  $\lim_{x \rightarrow 0} g(x) = 0$

(f)  $\lim_{x \rightarrow 0} g(x) = k$

(g)  $\lim_{x \rightarrow k} g(x) = g(k)$

(h)  $\lim_{x \rightarrow k} g(x) = 0$

(i)  $\lim_{x \rightarrow k} g(x) = k$

3. (2 points) Evaluate  $\csc(\arctan(0.5))$ .

4. (2 points each) Evaluate the following limits without the use of derivatives. Show sufficient justification for each answer. An answer of 'does not exist' is not sufficient. For infinite limits you must state if it is  $\infty$  or  $-\infty$ .

(a)  $\lim_{x \rightarrow 2^+} \frac{x^2 - 7x + 10}{x^2 - 4x + 4}$

(b)  $\lim_{x \rightarrow \infty} \frac{(2e^x + 3)^2}{5e^{2x} + 1}$