

Name: _____

AP

Classwork 9

First - "Indeterminate forms"

1. Find each limit

a) $\lim_{x \rightarrow 0} \frac{4}{x^2}$

b) $\lim_{x \rightarrow \infty} \frac{4}{x^2}$

c) $\lim_{x \rightarrow 4} \frac{4}{x^2}$

d) $\lim_{x \rightarrow 4+} \frac{4x}{x - 4}$

e) $\lim_{x \rightarrow 4} \frac{x^2 + 3x - 28}{x - 4}$

f) $\lim_{x \rightarrow 0} \frac{x}{x^2 - 3x}$

g) $\lim_{x \rightarrow 0} \frac{x^6 - x^4}{x^2}$

h) $\lim_{x \rightarrow 0} \frac{x^3 + x^2}{5x^6}$

i) $\lim_{x \rightarrow \infty} \frac{x^2 + 3x - 28}{x - 4}$

j) $\lim_{x \rightarrow \infty} \frac{x^6 - x^4}{x^2}$

k) $\lim_{x \rightarrow \infty} \frac{x^3 + x^2}{5x^6}$

2. Find each limit

a) $\lim_{x \rightarrow 4} \frac{1 - 6/x + 8/x^2}{x^2 - 16}$

b) $\lim_{x \rightarrow \infty} \frac{1 - 6/x + 8/x^2}{x^2 - 16}$

c) $\lim_{x \rightarrow 0} \frac{1 - 6/x + 8/x^2}{x^2 - 16}$

3. Find each limit.

a) $\lim_{x \rightarrow \infty} \frac{2x^4 + 5x^2 - 10x + 1}{x^5 + 7x^3 - 9}$

b) $\lim_{x \rightarrow 0} \frac{6x^7 - 3x^5 - 4x^3}{3x^6 + 6x^4 + 2x^3}$

4. Find $\lim_{x \rightarrow \infty} \frac{3x^3 - x - 1}{5x^3 + x^2}$

5. Find $\lim_{x \rightarrow 0} \frac{4x^5 + x^3 - 5x^2}{x^7 - 10x^4 + x^2}$

6. Find $\lim_{x \rightarrow 0} \frac{\sin x}{x}$

7. Find $\lim_{x \rightarrow 9} \frac{x^2 - 81}{\sqrt{x} - 3}$

8. Write the complex conjugate of each complex number.

a) $4 + 2i$

b) $3 - 7i$

c) $1 + .5i$

9. What could you multiply the following expression by in order to remove **all** square root signs?

$$4 - \sqrt{5}$$

10. Find $\lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 9} - 3}{x^2}$

11. Find $\lim_{x \rightarrow 10} \frac{\sqrt{x - 1} - 3}{x - 10}$

Practice Problems

1. Write a limit problem where plugging in gives you $0 \div 0$ but the limit equals 1.
2. Write a limit problem where plugging in gives you $0 \div 0$ but the limit equals ∞ .
3. True or false: It is possible for ∞/∞ to give you 0.
4. Find $\lim_{x \rightarrow 0} \frac{x^3 + 7x^2 - 1/x}{4x^4 + 1/x^2}$
5. Find $\lim_{x \rightarrow \infty} 4x^2 - x^3$