

MAC2241 Spring 2017
Suggested problems for Test 2
(Test 2 is Monday March 6th, in class)

Idris Mercer

February 27, 2017

1. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{1}{3n^4}$$

2. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{5}{3^n}$$

3. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{3 + 5n}{2 + 7n}$$

4. Evaluate the limit.

$$\lim_{n \rightarrow \infty} 1 - (0.2)^n$$

5. Evaluate the limit.

$$\lim_{n \rightarrow \infty} 2^{-n} + 6^{-n}$$

6. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{n^2}{\sqrt{n^3 + 4n}}$$

7. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{\pi^n}{3^n}$$

8. Evaluate the limit.

$$\lim_{n \rightarrow \infty} \frac{3^{n+2}}{5^n}$$

9. Evaluate the limit.

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

10. Evaluate the limit.

$$\lim_{x \rightarrow -\infty} 0.6^x$$

11. Evaluate the limit.

$$\lim_{x \rightarrow \infty} \frac{x - x\sqrt{x}}{2x^{3/2} + 3x - 5}$$

12. Evaluate the limit.

$$\lim_{x \rightarrow \infty} \frac{(2x^2 + 1)^2}{(x - 1)^2(x^2 + x)}$$

13. Evaluate the limit.

$$\lim_{x \rightarrow \infty} \frac{x^2}{\sqrt{x^4 + 1}}$$

14. Evaluate the limit.

$$\lim_{x \rightarrow \infty} (\sqrt{9x^2 + x} - 3x)$$

15. Determine whether the limit is $+\infty$ or $-\infty$.

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

16. Determine whether the limit is $+\infty$ or $-\infty$.

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

17. Determine whether the limit is $+\infty$ or $-\infty$.

$$\lim_{x \rightarrow 1} \frac{2 - x}{(x - 1)^2}$$

18. Determine whether the limit is $+\infty$ or $-\infty$.

$$\lim_{x \rightarrow 5^-} \frac{e^x}{(x - 5)^3}$$

19. Determine whether the limit is $+\infty$ or $-\infty$.

$$\lim_{x \rightarrow 3^+} \ln(x^2 - 9)$$

20. Determine whether the limit is $+\infty$ or $-\infty$.

$$\lim_{x \rightarrow 2^-} \frac{x^2 - 2x}{x^2 - 4x + 4}$$

21. Evaluate the limit.

$$\lim_{x \rightarrow 5} \frac{x^2 - 6x + 5}{x - 5}$$

22. Evaluate the limit.

$$\lim_{x \rightarrow 4} \frac{x^2 - 4x}{x^2 - 3x - 4}$$

23. Evaluate the limit.

$$\lim_{t \rightarrow -3} \frac{t^2 - 9}{2t^2 + 7t + 3}$$

24. Evaluate the limit.

$$\lim_{h \rightarrow 0} \frac{(4 + h)^2 - 16}{h}$$

25. Evaluate the limit.

$$\lim_{h \rightarrow 0} \frac{(2 + h)^3 - 8}{h}$$

26. Evaluate the limit.

$$\lim_{h \rightarrow 0} \frac{\sqrt{1 + h} - 1}{h}$$

27. Evaluate the limit.

$$\lim_{x \rightarrow -4} \frac{\frac{1}{4} + \frac{1}{x}}{4 + x}$$

28. Evaluate the limit.

$$\lim_{x \rightarrow -1} \frac{x^2 + 2x + 1}{x^4 - 1}$$

29. Evaluate the limit.

$$\lim_{x \rightarrow 16} \frac{4 - \sqrt{x}}{16x - x^2}$$

30. Evaluate the limit.

$$\lim_{t \rightarrow 0} \left(\frac{1}{t} - \frac{1}{t^2 + t} \right)$$

31. Find the derivative of the function using the definition of derivative.

$$f(x) = \frac{1}{2}x - \frac{1}{3}$$

32. Find the derivative of the function using the definition of derivative.

$$f(x) = 5x - 9x^2$$

33. Find the derivative of the function using the definition of derivative.

$$f(x) = \frac{1}{\sqrt{x}}$$

34. Find the derivative of the function using the definition of derivative.

$$f(x) = x^4$$