Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Math 104 Hand In Homework # 1 Review Material

1. Find the value of the limit $\lim_{x \to 1} \frac{2x^2 + x - 3}{x^2 - x}$.

   a. 5
   b. 4
   c. 3
   d. 2
   e. $\frac{7}{2}$
   f. $\frac{3}{2}$
   g. $\frac{1}{2}$
   h. 0

2. Evaluate $\lim_{x \to 0} \frac{8x^2}{\cos x - 1}$

   a. 8
   b. -16
   c. 16
   d. 2
   e. 0
   f. -8
   g. Does not exist
   h. None of these

3. Find the distance between the two values of x at which the function $\frac{1}{x^2 - 3x + 2}$ is discontinuous.

   a. 3
   b. 2
   c. 8
   d. 1
   e. 5
   f. 4
   g. 7
   h. 6

   Refer to the following table for the next two questions:

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
−6	7	−8	−6	7
−4	1	−5	0	5
−2	3	−2	4	3
0	5	0	6	1
2	5	1	6	1
4	−3	3	4	−3
6	1	5	0	−5

4. Find $\frac{d}{dx}(f(x) \cdot g(x))$ when $x = -2$.

   a. 1
   b. 2
   c. 3
   d. 4
   e. −1
   f. −2
   g. −3
   h. −4

5. Find $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right)$ when $x = 0$.

a. $-\frac{7}{36}$
b. $-\frac{5}{36}$
c. $-\frac{3}{36}$
d. $-\frac{1}{36}$
e. $\frac{3}{36}$
f. $\frac{5}{36}$
g. $\frac{7}{36}$
h. $\frac{11}{36}$

6. Let $f(x) = x + \sin(2x)$. Find $f'(0)$.

a. 0
b. 1
c. -1
d. 2
e. -2
f. 3
g. -3
h. None of these

7. If $f(x) = \sqrt[3]{x^2 - 1}$. Find $f'(3)$.

a. $\frac{1}{3}$
b. $\frac{1}{2}$
c. $\frac{1}{6}$
d. $\frac{5}{6}$
e. $\frac{1}{4}$
f. $\frac{2}{3}$
g. $\frac{5}{12}$
h. None of these

8. Let $f(x) = \arctan(3\ln x)$. Find $f'(e)$.

a. 0
b. $\frac{2}{5e}$
c. $\frac{2e}{5}$
d. $\frac{1}{10e}$
e. $\frac{3}{10}$
f. $\frac{3}{4e}$
g. $\frac{3}{10e}$
h. None of these

9. At what value of x does the function $f(x) = \frac{1}{1+x^2}$ change from increasing to decreasing?

a. 1
b. -1
c. $-\frac{1}{2}$
d. 2
e. $\frac{1}{2}$
f. -2
g. 0
h. $-\frac{3}{2}$

10. Find the absolute minimum value of the function $f(x) = x^3 + x^2 - 8x + 5$ on the interval $[-3, 2]$.

a. -3
b. -2
c. 2
d. 1
e. $\frac{-41}{27}$
f. 17
g. -1
h. None of these

11. How many points of inflection does the function $f(x) = 3x^5 - 10x^3 + 5$ have?

a. 5
b. 0
c. 2
d. 7
e. 6
f. 1
g. 3
h. 4

12. Find the value of the integral $\int_1^3 \frac{1}{x^2}\,dx$.

a. $\frac{2}{3}$
b. $\frac{1}{2}$
c. $-\frac{1}{2}$
d. $-\frac{1}{3}$
e. $-\frac{2}{3}$
f. 1
g. $\frac{1}{3}$
h. -1

13. Evaluate $\int_0^3 \left(e^{2x} + x^3\right) dx$.

a. $\frac{1}{6}e^6 + \frac{81}{4}$
b. $e^6 - \frac{79}{4}$
c. $\frac{1}{2}e^6 + \frac{81}{4}$
d. $\frac{1}{2}e^6 + \frac{79}{4}$
e. $\frac{1}{2}e^6 + \frac{83}{4}$
f. $e^6 + \frac{83}{4}$
g. $2e^6 + \frac{81}{4}$
h. None of these

14. Find the value of the integral $\int_0^1 \frac{x^2}{\left(x^3+1\right)^2}\,dx$.

a. $\frac{3}{4}$
b. 2
c. $\frac{3}{7}$
d. $\frac{7}{3}$
e. $\frac{1}{6}$
f. $\frac{3}{2}$
g. $\frac{2}{3}$
h. 1

15. Find the value of $\int_e^{e^2} \frac{(\ln x)^2}{x}\,dx$.

a. $\ln 2$
b. $\frac{1}{2}\ln 2$
c. $\frac{1}{2}$
d. $\frac{3}{2}$
e. 1
f. $1/(\ln 2)$
g. 0
h. $\frac{7}{3}$

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Answer Section

1. ANS: A PTS: 1
2. ANS: B PTS: 1
3. ANS: D PTS: 1
4. ANS: A PTS: 1
5. ANS: B PTS: 1
6. ANS: F PTS: 1
7. ANS: B PTS: 1
8. ANS: G PTS: 1
9. ANS: G PTS: 1
10. ANS: E PTS: 1
11. ANS: G PTS: 1
12. ANS: A PTS: 1
13. ANS: D PTS: 1
14. ANS: E PTS: 1
15. ANS: H PTS: 1