

Math 1311

**Homework 1 (Section 1.1 – Section 1.2)**

Record your answers to all the problems in the EMCF titled “**Homework 1.**”

For exercises 1-5 evaluate the given functions as required.

1.  $f(x) = (3 + x^{1.2})^{x+3.8}$  at  $x = 4.3$

- a. 52,852,123.02
- b. 42,943,441.08
- c. 38,568,225.03
- d. 40,365,985.07

2.  $g(x, y) = \frac{x^3+y^3}{x^2+y^2}$  at  $x = 4.1, y = 2.6$

- a. 4.57
- b. 3.67
- c. 2.37
- d. 8.96

3. Calculate  $f(1.3)$  if  $f(t) = 87.1 - e^{4t}$

- a. -94.17
- b. 93.25
- c. 96.32
- d. -96.32

4. Evaluate the formula  $(x+y)^{-x}$  using  $x=2$  and  $y=3$ . Round your answer to four decimal places.

- a. 2.11
- b. 3.00
- c. 0.04
- d. 0.01

5. You have just received word that your original investment of \$1950 has increased in value by 11%. What is the value of your investment today?

- a. \$2264.50
- b. \$2364.50
- c. \$2164.50
- d. \$2184.00

6. A ball is tossed upward from a tall building, and its upward velocity  $V$  in feet per second, is a function of time  $t$ , in seconds, since the ball was thrown. The formula is  $V(t) = 80 - 32t$  if we ignore air resistance. Express using functional notation the velocity 4 seconds after the ball is thrown and then calculate that value. Is the ball rising or falling then?
- $V(4) = -32 \text{ ft/sec}$ ; ball is falling
  - $V(4) = 32 \text{ ft/sec}$ ; ball is rising
  - $V(4) = 48 \text{ ft/sec}$ ; ball is rising
  - $V(4) = -48 \text{ ft/sec}$ ; ball is falling
7. Using the information from problem 6, find the velocity change from one second to the next?
- The velocity changes by -80 feet per second for each second that passes.
  - The velocity changes by -32 feet per second for each second that passes.
  - The velocity changes by 80 feet per second for each second that passes.
  - The velocity changes by 32 feet per second for each second that passes.
8. Section 1.1 Exercise 6a
- In 1904, the winning height is 3.5 m.
  - In 1994, the winning height is 5.5 m.
  - In 1904, the winning height is 5.5 m.
  - In 1994, the winning height is 3.5 m.
9. Section 1.1 Exercise 8a
- 3.66
  - 4.56
  - 7.65
  - 2.88
10. Section 1.1 Exercise 8b
- $C(3)$ ; 2.05
  - $C(3)$ ; 1.02
  - $C(180)$ ; 3.25
  - $C(180)$ ; 1.86

For exercises 11-15 use the table below:

$t$	$N = N(t)$
10	17.6
20	23.8
30	44.6
40	51.3
50	53.2
60	53.7
70	53.9

11. Use averaging to estimate the value of  $N(15)$ .

- a. 15.4
- b. 18.2
- c. 23.5
- d. 20.7

12. Use averaging to estimate the value of  $N(35)$ .

- a. 55.85
- b. 49.63
- c. 80.32
- d. 47.95

13. Use averaging to estimate the value of  $N(55)$ .

- a. 53.45
- b. 60.59
- c. 59.60
- d. 63.52

14. Calculate the average rate of change from  $t = 10$  to  $t = 20$ . Use your answer to estimate the value of  $N(13)$ .

- a. 20.58
- b. 15.87
- c. 19.46
- d. 23.65

15. Calculate the average rate of change from  $t = 30$  to  $t = 40$ . Use your answer to estimate the value of  $N(36)$ .

- a. 48.62
- b. 52.63
- c. 45.36
- d. 37.52

16. Using the table below, find the average rate of change in  $N$  from  $t = 69$  to  $t = 82$ . Round the answer to the nearest hundredth.

$t$	30	43	56	69	82	95	108
$N(t)$	93.06	133.69	174.31	214.94	255.56	296.19	336.81

- a. 4.35
- b. 4.55
- c. 1.45
- d. 3.12

17. The following table shows the value  $B$ , in billions of dollars, of new construction put in place in the United States during year  $t$ . Determine over what period was the growth in value of new construction the greatest?

$t =$ Year	$B =$ Value (billions of dollars)
1995	617.9
1998	766.5
2001	874.8
2004	1144.7

- a. 1995 to 1998
- b. 1998 to 2001
- c. 2001 to 2004
- d. 1995 to 2004

18. If you borrow  $P$  dollars at a monthly interest rate of  $r$  (as a decimal) and wish to pay off the note in  $t$  months by monthly payments of  $M$ , then  $P = P(M, r, t)$ , the functional relationship between these variables can be defined by the following formula:

$$P = M \times \frac{1}{r} \times \left( 1 - \frac{1}{(1+r)^t} \right).$$

Suppose you can afford to pay \$460 per month for 5 years. How much money can you afford to borrow for the purchase of a car if the prevailing monthly interest rate is 0.32%? Express the answer in functional notation, and then calculate it.

- a.  $P(46, 35, 0.032) = \$250,757.64$
- b.  $P(460, 0.0032, 60) = \$25,075.76$
- c.  $P(5520, 1.032, 48) = \$25,836.74$
- d.  $P(0.0032, 480, 4.17) = \$2122.30$

19. Section 1.2 Exercise 6b

- a.  $G(2006) = 13.12$
- b.  $G(2006) = 14.15$
- c.  $F(2006) = 13.12$
- d.  $G(2006) = 14.76$

20. Section 1.2 Exercise 8c

- a. 42.5
- b. 58.4
- c. 48.6
- d. 50.2