**MTH 170 (College Algebra/Pre-Calc A) Final Exam Review**

**Find the equation of the line (in slope-intercept form) satisfying the given conditions.**

1. Passing throughand perpendicular to the line passing throughand
2. Passing throughand parallel to

**Solve**

**Use the graph to answer the following questions**

1. Determine the intervals on which the following function is (a) increasing, (b) decreasing, and (c) constant. Then give the (d) domain and (e) range.



**Determine if the following functions are even, odd, or neither.**

1. 
2. 
3. 
4. 
5.

**Give the equation of the function whose graph is described.**

1. The graph ofis shifted 2 units to the left. This graph is then vertically stretched by applying a factor of 1.5. Finally, the graph is shifted 8 units upward.

**Solve.**

1. 
2. 
3.
4. 

**Write a piecewise-defined function that represents the graph below. Then give the domain and range**

1.

**Givenandfind the following:**

1. 
2. 
3. 
4. 

**Given and find the following:**

1. and the domain of

**Find the average rate of change for the given function over the given interval**

1. from to
2. from to

**Find the difference quotient for the following function**

**Simplify. Write each expression in the form**

1. 
2. 
3. 
4. 
5.

**Find the equation of the quadratic function satisfying the given conditions. Write your answer in the form**

1. Vertex: through

**Write the following function in vertex form**

**Find the vertex of the graph of the following function**

**Solve.**

1. 
2. 
3. 
4. 
5.

**Use the functionto answer the following.**

1. Use the leading coefficient test to determine the graph’s end behavior.
2. Find the x-intercept(s).
3. Find the y-intercept(s).
4. Determine whether the graph has y-axis symmetry, origin symmetry, or neither.
5. What are the maximum number of turning points?

**Divide.**

1. 
2. 

**Use synthetic division to find**

1. ,

**Find all zeroes of the following function**

1. given that is a zero

**Completely factor the following function**

**Find a cubic polynomial with the following zeroes:**

1. and

**Sketch a rough graph of the following function by finding the end behavior, zeroes, and their multiplicity**

1.

**Solve each equation and inequality. Assume that *k* is a positive constant.**

1.
2.

**Find all asymptotes (horizontal, vertical, and slant) of the following functions.**

1. 
2. 

**Solve.**

1.
2.
3. 

**Determine the domain of each function.**

1. 
2. 
3.

**Simplify the following expression so that it does not contain negative exponents**

**Solve.**

1.
2.
3. 
4. 

**Determine if the following functions are one-to-one. If so, find their inverse. If not, state “not one-to-one”**

1. 
2. 
3. 
4. 

**Decide whether the pairs of functions are inverses.**

1. 
2. 

**Use the properties of logarithms to expand the expression completely, if possible**

1. 
2. 
3. 
4. 

**Use the properties of logarithms to rewrite each expression as a single logarithm with coefficient 1.**

1. 
2. 
3. 

**Find the domain of each logarithmic function.**

1. 
2. 
3. 
4. 

**Use the change-of-base rule to find an approximation for each logarithm to 3 decimal places.**

1. 
2. 

**Solve. Express all solutions in exact form.**

1.
2.
3.
4. 
5. 
6. 
7. 
8. 
9. 

**Solve each formula for the indicated variable.**

1. 
2. 
3. 

**Sketch a graph of the following function**

1.

**Solve each system.**

1. 
2. 
3. 

**Solve using Matrix Row Operations**

1. 
2. 

**Graph the system of Nonlinear Inequalities**

1. 
2. 

**Applications.**

1. The manager at a restaurant earns 15% more than the chef. Together, their salaries are $78,475. How much is the manager’s salary?
2. How much water should be added to 8 milliliters of 6% saline solution to reduce the concentration to 4% saline?
3. A baseball is hit so that its height in feet after seconds is . How high is the baseball after 1 second? Find the maximum height of the baseball.
4. A raised wooden walkway is being constructed through a wetland. The walkway will have the shape of a right triangle with one leg 700 yards longer than the other and the hypotenuse 100 yards longer than the longer leg. Find the total length of the walkway.
5. You have 80 yards of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area. What is the maximum area?
6. The growth of bacteria in food products makes it necessary to date some products (such as milk) so that they will be sold and consumed before the bacterial count becomes too high. Suppose that, under certain storage conditions, the number of bacteria present in a product iswhere *t* is time in days after packing of the product and the value of is in millions. If the product cannot be safely eaten after the bacterial count reaches 3,000,000,000, how long will this take?

**Answer Key**

1. 
2. 
3. (a) none (b) (c) (d) (e)
4. Odd
5. Even
6. Neither
7. Even
8. Odd
9. 
10. 
11. No solution
12. 
13. Domain: Range:
14. 5
15. 3
16. Undefined
17. 
18. Domain:
19. 
20. 
21. 
22. 
23. 
24. 
25. 
26. 
27. 
28. As approaches , approaches
29. 
30. 
31. Neither
32. 3
33. 
34. 
35. 
36. VA:  HA: None SA: 
37. VA:  HA:  SA: None
38. 
39. 
40. 
41. 
42. 
43. Not one-to-one
44. 
45. 
46. 
47. Yes
48. No
49. 
50. Cannot be rewritten
51. 
52. 
53. 
54. 
55. 
56. 
57. 
58. 
59. 
60. 
61. 
62. 
63. No solution
64. 
65. 
66. e
67. 2.5
68. 
69. 
70. 3
71. 
72. 
73. 
74. 
75. 
76. No solution
77. 
78. 
79. 
80. 
81. 
82. $41,975
83. 4 mL
84. 32 ft, 34.25 ft
85. 3000 yards
86. 20 yards by 20 yards; 400 yards squared
87. 18 days