

MATH 1320 Final Exam  
Fall 2018

You may NOT use any electronic device, books or notes on this exam. Be neat in your work and clearly mark your answer.

1. Simplify the following expression:

$$\frac{15x^7y^2}{5x^3y^3}$$

2. Consider  $f(x) = 8 - x^2 + 2x$ . What are the maximum or minimum points?  
Graph the equation.

3. Solve the following rational equation:

$$\frac{2}{x+3} - \frac{1}{x-3} = \frac{3}{x^2-9}$$

4. Perform the indicated operations and write the result in standard form:

$$(-4 + 5i)(1 + 3i)$$

5. Use the quadratic formula to solve:

$$4x^2 + 7 = 2x$$

6. Solve the following radical equation:

$$\sqrt{x+10} = x - 2$$

7. Given  $f(x) = 4x - 3$ , find  $f(x + 3)$  and simplify.

8. Solve:  $|2x + 4| - 9 = -7$ .

9. What is the equation of the line passing through  $(2, -3)$  and parallel to the line  $y = -x + 7$ . Give your answer in point-slope form.

10. Solve:  $-35x - 30 \leq -5(6x + 4)$ .  
Express the answer in interval notation.

11. Solve:  $x^3 - 2x^2 - 5x + 6 = 0$  if you know  $x = 1$  is a solution.

12. Write in standard form the equation of a circle with radius 4 and center at  $(2, -3)$ .

13. Evaluate the following expression

$$e^{\ln(2x^3)}$$

14. Find a third degree polynomial  $f(x)$  with real coefficients and leading coefficient 1 if  $x = 3$  and  $x = 2i$  are two of its zeros. Find  $f(2)$ .

15. Solve:  $3^{4-x} = \frac{1}{9}$ .

16. A watch maker charged a customer \$280.00 to repair an expensive watch. The bill listed \$80.00 for parts and the rest for labor. If labor is \$50.00 an hour, how many hours did they work on the watch?

17. Solve the system of equations:

$$\begin{aligned}5x - 6y &= 2 - 5x \\2x + 6y &= x + 5y - 3.\end{aligned}$$

18. A six-sided die is rolled. What is the probability of getting a number great than 3?

19. What is the domain of:

$$f(x) = \frac{2x - 1}{x^2 - 9}.$$

Give your answer in interval notation.

20. What is the equation of the curve if  $y = x^2$  is translated to the left 3 units and up 4 units.

Extra Credit: Use mathematical induction to prove  $1 + 3 + 5 + 7 + 9 + \dots + (2m - 1) = m^2$ .