

Math 176 — Quiz 4  
Professor Busken

Name: \_\_\_\_\_

**Directions:** You may NOT use a calculator. The use of any other electronic devices are strictly prohibited. Show your work on ALL of the questions. Do NOT work together. Tutor help NOT okay. Due Monday, September 16th at 5:30 pm., with no exceptions. Late work will not be accepted.

1. (5 points) Find all the zeros of  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$ . What is the multiplicity of each root?

1. \_\_\_\_\_

2. (3 points) Write the complete factorization of  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$  here.

3. (2 points) What is the domain of  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$ ?

3. \_\_\_\_\_

4. (2 points) Find the  $y$ -intercept of  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$

4. \_\_\_\_\_

5. (4 points) Write an end behavior description for  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$

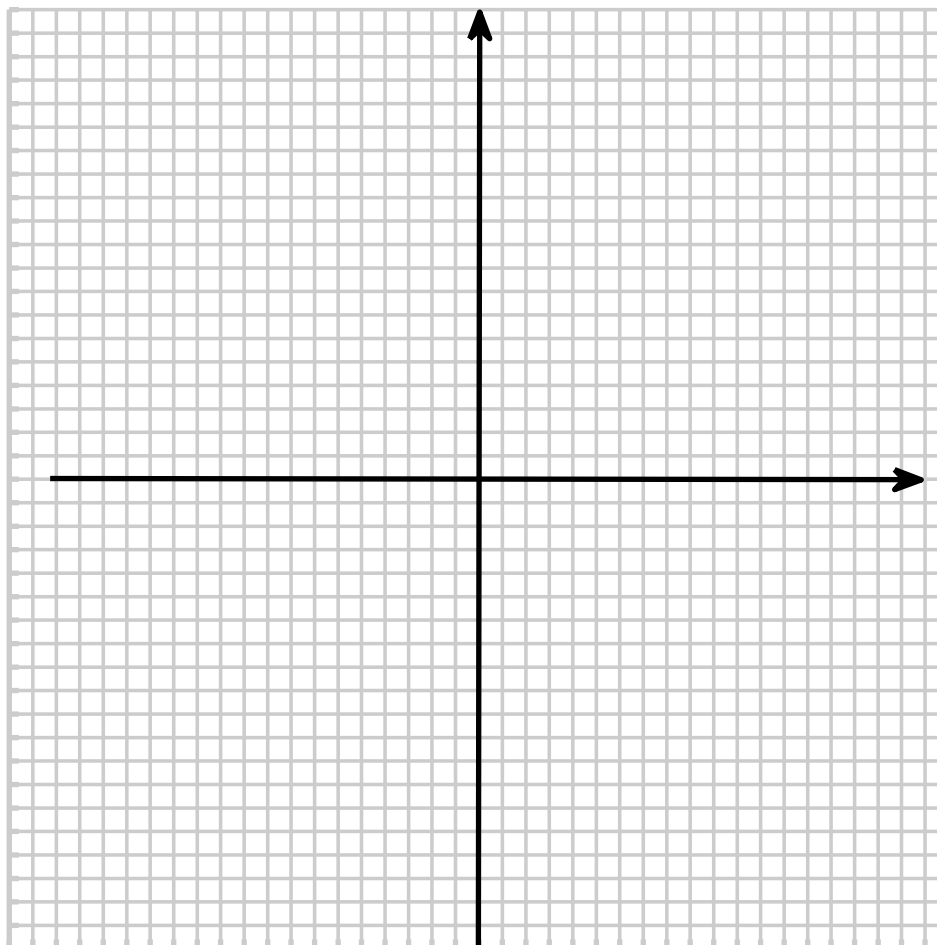
6. (2 points) Find the solution set to  $f(x) > 0$  for  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$

6. \_\_\_\_\_

7. (2 points) Find the solution set to  $f(x) < 0$  for  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$

7. \_\_\_\_\_

8. (4 points) Graph  $f(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$ . Label some points and the axes for full credit.



9. (5 points) Find the quotient and the remainder for  $\frac{9x^3 - x + 5}{3x^2 - 7x}$

9. \_\_\_\_\_

10. (5 points) Divide and simplify  $\frac{5 - 8i}{2 + 3i}$ . Write your solution in the form  $a + bi$ .

10. \_\_\_\_\_

11. (5 points) Find a polynomial with integer coefficients that satisfies the given conditions. The polynomial is degree 4 and has a zero  $1+2i$  with multiplicity 2. Write the polynomial in descending order (leaving your polynomial in factored form doesn't constitute a full credit answer).

11. \_\_\_\_\_

12. (2 points) Use interval notation to write the domain of  $f(x) = \frac{-2}{(x-1)^2}$  12. \_\_\_\_\_
13. (2 points) Find the horizontal asymptote of  $f(x) = \frac{-2}{(x-1)^2}$  13. \_\_\_\_\_
14. (2 points) Find the vertical asymptote(s) of  $f(x) = \frac{-2}{(x-1)^2}$  14. \_\_\_\_\_
15. (2 points) Describe the behavior of the graph of  $f$  around its vertical asymptote(s).
16. (4 points) Graph  $f(x) = \frac{-2}{(x-1)^2}$ . Label some points and the axes for full credit.

