Quiz, Fall Week 3 Name: _____

Points possible: 100 Math 1050-90, Fall 2021, Due 9/14 at 11:59 p.m.

Rules/Suggestions: Write with a dark pencil, so that your work is visible. **You are graded on your work, not just answers. Even if you do calculations in your head or on scratch, show work if space is provided.** Write the final answer in the box.

Notes: You are on your honor for this to be your own work. (You can ask for help on quiz material, but you should not ask for help on specific problems.)

1. Find the degree, leading term, leading coefficient, constant term, and end behavior of the given polynomial.

$$f(x) = 12 + 7x^2 - 5x^3 - 2x^6$$

(1.1) (5 points) Rewrite the polynomial in order of descending degree. What is the degree, leading term, leading coefficient, and constant term of f?

Answers: $f(x) =$

- degree: _____
- leading coefficient:_____
- leading term: _____
- constant term:_____

(1.2) (10 points) Explain how to figure out the end behavior of f, then state the end behavior.

Explanation:

- As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

Explanation:

- As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

2. For $g(x) = 2x(x+4)^2(x+1)(x-5)$, fill in the following information.

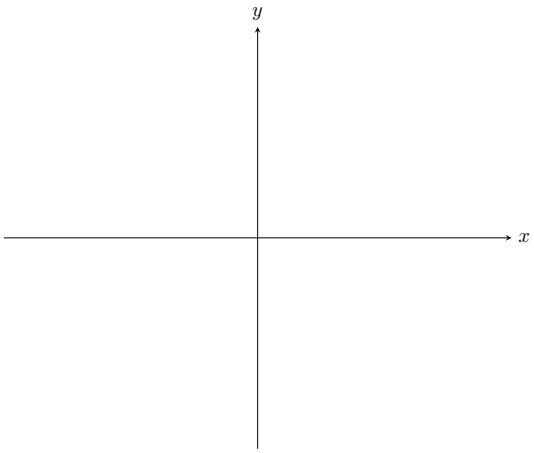
(2.1) (6 points) All the zeros/roots:

(2.2) (2 points) As $x \to -\infty$, $g(x) \to$ _____

(2.3) (4 points) y-intercept:
(Write an ordered pair)

(2.4) (2 points) As $x \to \infty$, $g(x) \to$ _____

(2.5) (10 points) Sketch its graph. Label with numbers the values of zeros/x-intercepts.



(2.6) (2 points) Using your graph, where is $g(x) > 0$? Write your answer with interval notation.

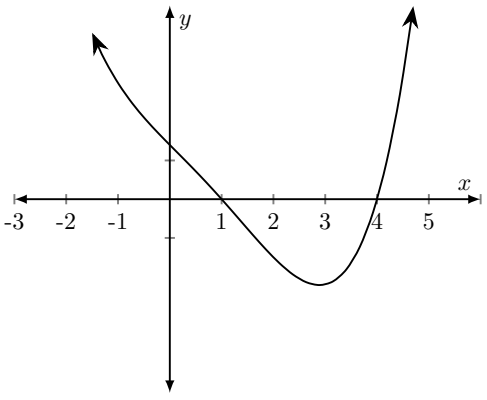
_____

3. (12 points) Write $f(x) = x^4 + 4x^3 - 7x^2 - 34x - 24$ in factored form. Use the fact that both $(x + 1)$ and $(x + 2)$ are factors of f.

Answer:

$f(x) =$

4. (12 points) Find all the zeros of $f(x) = x^4 - 3x^3 + x^2 - 27x + 28$. A graph of f is provided as a hint. Simplifying the roots and fractions in answers is optional.



Answer:

5. Given $f(x) = x^4 + x^3 - 18x^2 - 52x - 40$.

(5.1) (5 points) Write the possible rational roots according to the **Rational Zero Theorem**.

Answer:

(5.2) (8 points) Use synthetic division to test possible rational roots. Test the possible values until you find a root. When you find one, circle the work. If you are lucky and find it the first time, show one more test of a different value.

(5.3) (10 points) Find ALL the zeros of $f(x) = x^4 + x^3 - 18x^2 - 52x - 40$. Write the function in fully factored form.

Answer:

6. (12 points) Find the real solutions of the polynomial equation $x^3 + 14 = 6x^2 + 9x$. Write your answers as a list.

Answer: