

Name _____

22M:002

11/12/2004

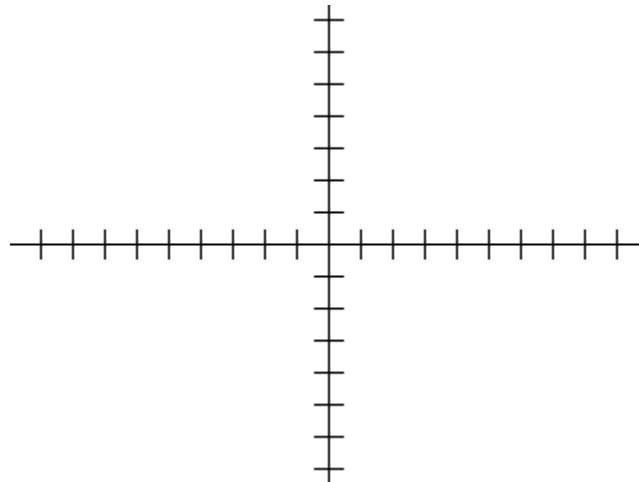
Score (100 possible) _____

Midterm Exam #2

Answer each question to the best of your ability. Show all of your work.

1. The diameter of a circle passes through the points $(-1, 5)$ and $(5, -1)$. Find the center-radius equation and standard equation of the circle. (15 points)

2. a) Graph the line $x - 2y = 4$. (3 points)
b) Find the equation of a line parallel to $x - 2y = 4$ through the point $(2, 2)$. Graph this line with the graph of (a). (6 points)
c) Find the equation of a line perpendicular to $x - 2y = 4$ through the point $(2, 2)$. Graph this line with the graph of (a) and (b). (6 points)
Label each line with its equation.

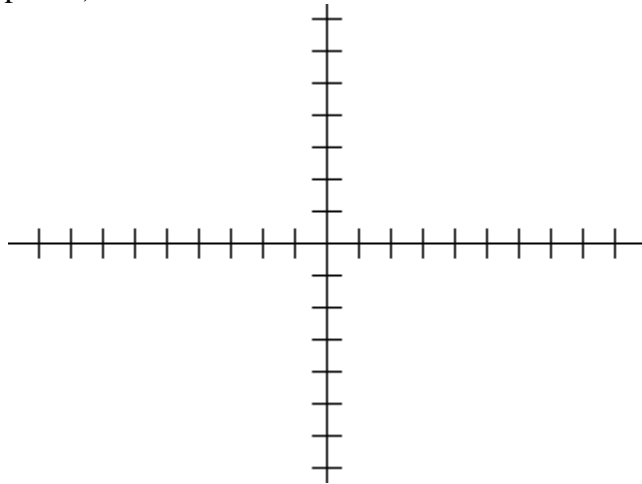


3. Given the function $f(x) = x^5 - 2x^4 - 5x^3 + 6x^2$

- a. The order of this polynomial is _____. (1 point)
- b. We should be looking for _____ zeros. (how many?) (1 point)
- c. What is the end behavior of the function? (1 point)

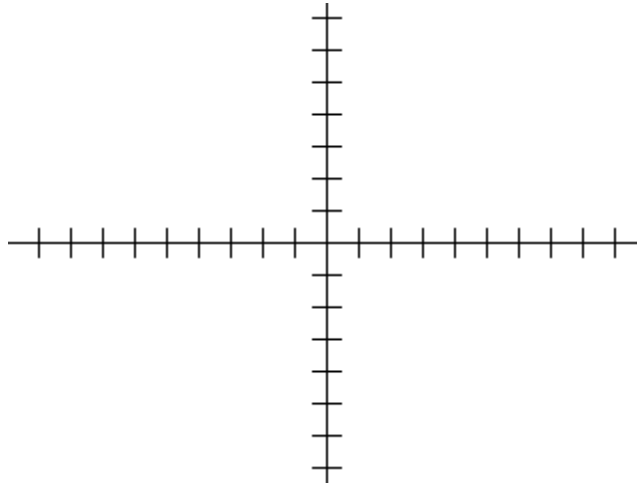
- d. Find all of the factors of the function. (4 points)

e. Graph the function. (5 points)



f. Use synthetic division to find $f(-3)$. (3 points)

4. Graph the function $f(x) = \begin{cases} 3x-1 & \text{if } x < 2 \\ x+3 & \text{if } x \geq 2 \end{cases}$. (10 points)



5. Suppose

$$f(x) = |x - 2|$$

$$g(x) = x^3 - 3x$$

Calculate each of the following values:
(3 points each)

a. $(f \circ g)(2)$

b. $(g \circ f)(2)$

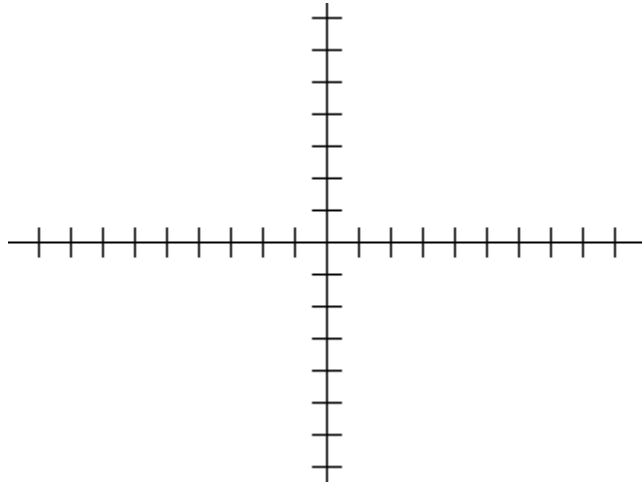
c. $(f \circ g)(3)$

d. $(g \circ f)(3)$

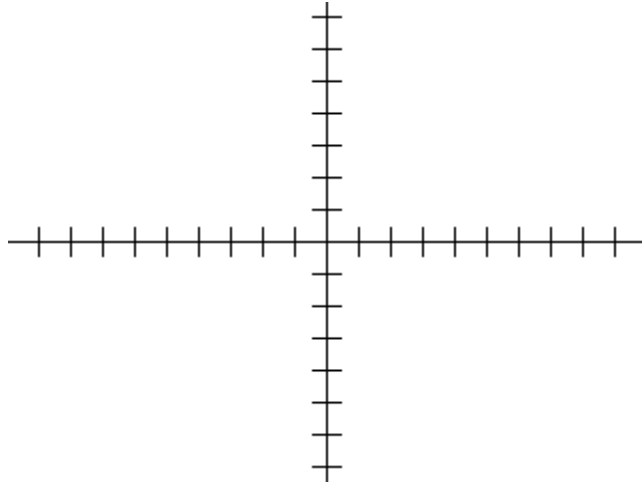
e. $(f \circ g)(x)$

6. Sketch the following functions on the axes provided. (5 points each)

a. $y = -\sqrt{x+1} + 2$



b. $y = 2|x-2| - 2$



c. $y = 2x^2 - 6x + 5$

