

# Math 1050 Section 3

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## Chapter 3 Exam Form B

**DO NOT WRITE ON THIS EXAM!**

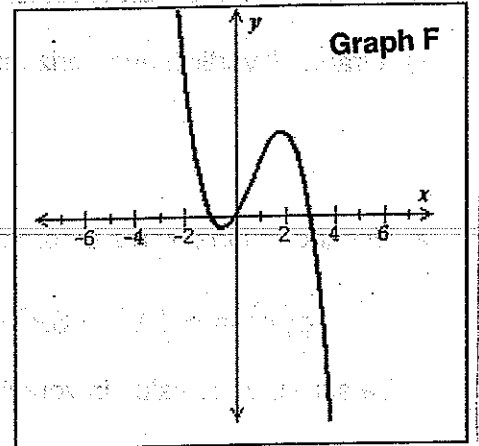
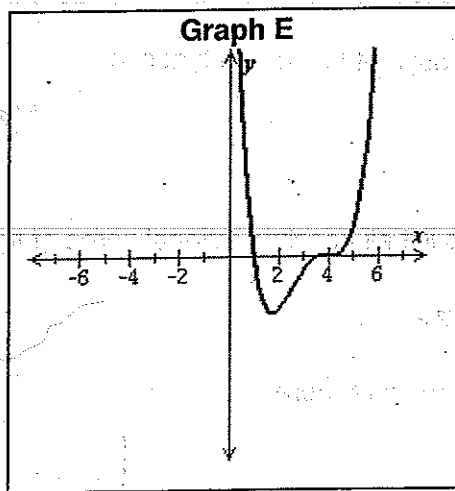
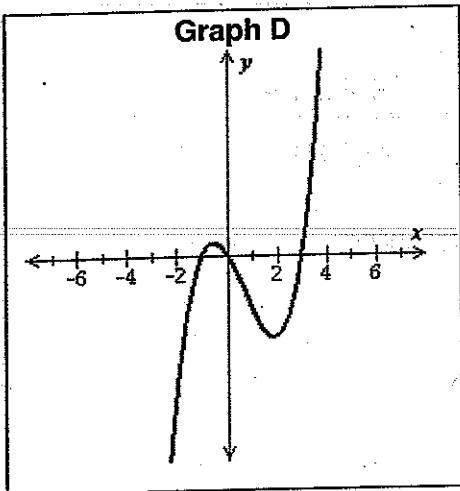
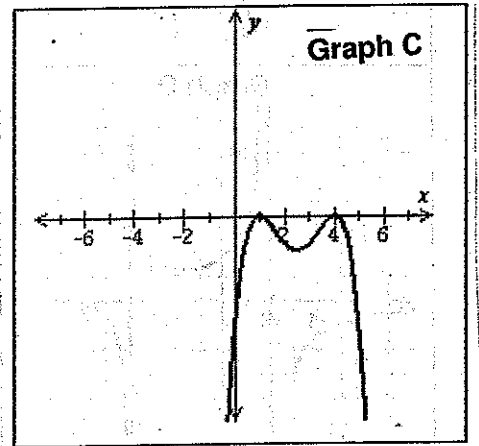
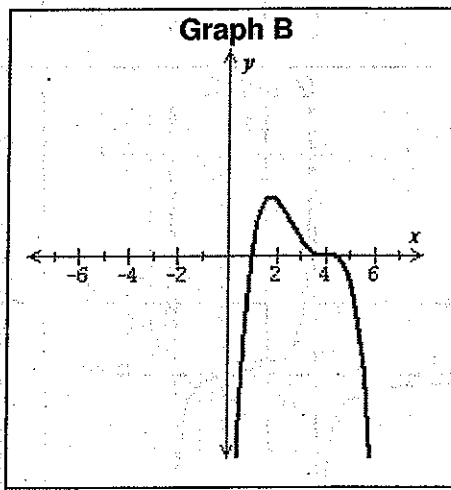
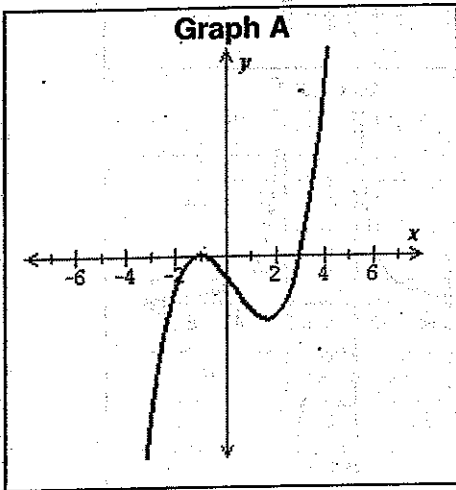
Directions: Put your name on each piece of scratch paper that you use. Turn in your scratch paper along with your answer sheet when you finish the exam. Do each problem in order on your scratch paper showing all the steps of your solution. Put your final answer neatly on the answer sheet. Remember to check your answers to insure a good score. Good luck, your preparation will pay off!

1. Consider the following polynomial functions.

$$f(x) = 2x^3 - 4x^2 - 6x$$

$$h(x) = -(x-4)^3(x-1)$$

Choose the graph of each function from the choices below.

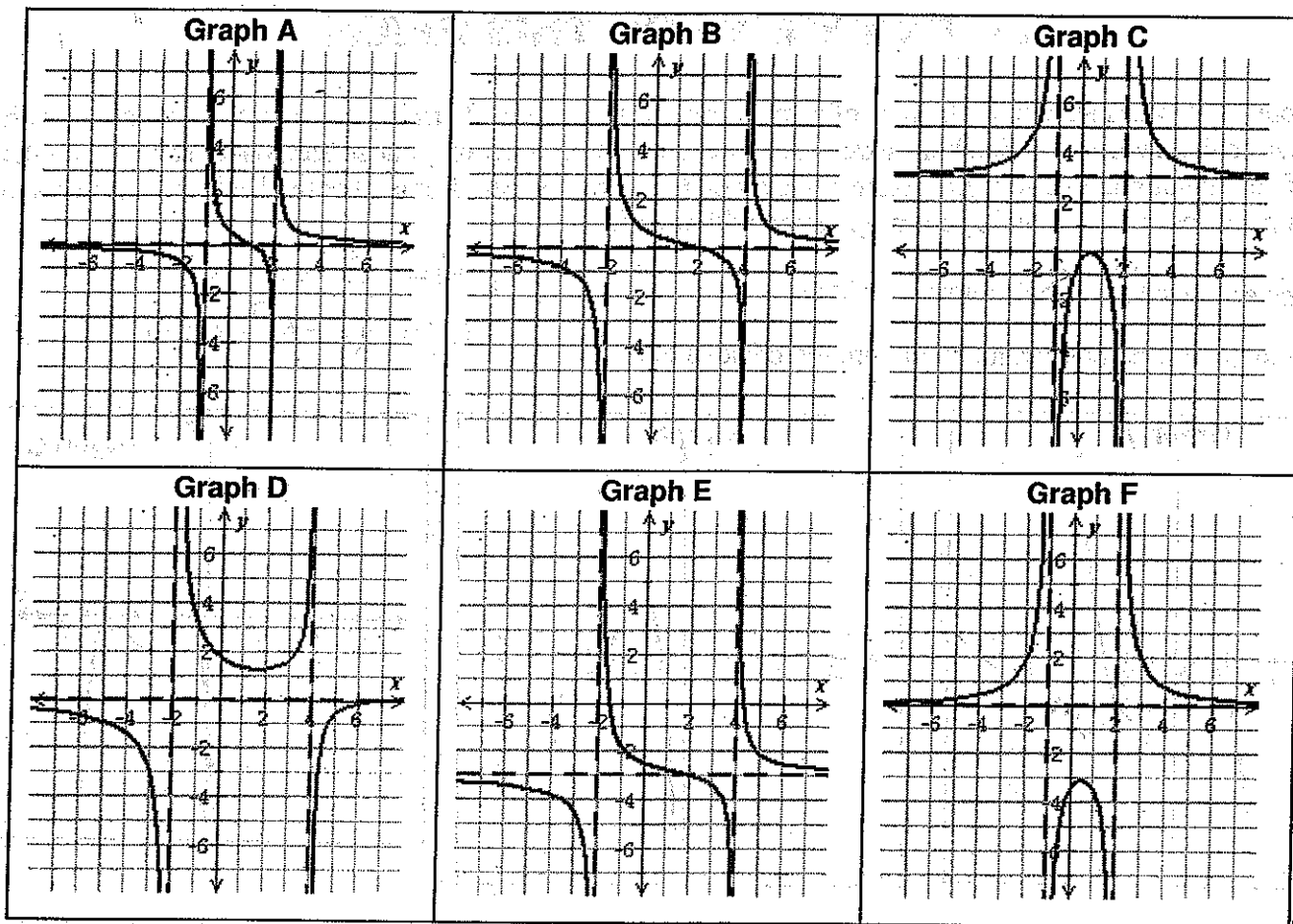


2. Consider the following rational functions.

$$f(x) = \frac{7}{x^2 - x - 2}$$

Choose the graph of each function from the choices below.

$$g(x) = \frac{2x - 4}{x^2 - 2x - 8}$$



3. Graph all vertical and horizontal asymptotes of the function.

$$f(x) = \frac{x^2 + 4x + 4}{-x^2 + 1}$$

4. Use the rational zeros theorem to list all possible rational zeros of the following.

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

Be sure that no value in your list appears more than once.

5. Solve the following inequality.

$$\frac{-x + 5}{x - 2} > 0$$

Write your answer using interval notation.

6.

Graph the rational function  $f(x) = \frac{-x^2 - 5x - 1}{x + 1}$ .

To graph the function, draw the asymptotes (if any) and plot at least two points on each piece of the graph.

7. Graph all vertical and horizontal asymptotes of the function.

$$f(x) = \frac{2x + 13}{-4x - 10}$$

8. Find a polynomial  $f(x)$  of degree 3 with real coefficients and the following zeros.  $-4, -3 + i$ 9. Use a graphing calculator to find all the zeros of the polynomial function.  $f(x) = 3x^3 - 9x^2 + 3x + 2$ 

Round to the nearest hundredth. If there is more than one answer, separate them with commas.

10. Use a graphing calculator to find the  $x$ -intercept(s) and vertex for the quadratic function.

$$f(x) = 4x^2 + 2x - 3$$

If there is more than one  $x$ -intercept, separate them with commas.

Round to the nearest hundredth if necessary.

11.

Graph the rational function  $g(x) = \frac{-3x - 15}{x^2 + 7x + 10}$ .

12. For the polynomial below, 1 is a zero. Express  $g(x)$  as a product of linear factors.

$$g(x) = x^3 + x^2 + 8x - 10$$

13. Find a polynomial  $f(x)$  of degree 4 that has the following zeros.  $-6, 0, 5, 9$ 

Leave your answer in factored form.

14.

Graph the rational function  $f(x) = \frac{2x + 3}{-2x - 4}$ . To graph the function, draw the horizontal and vertical

asymptotes (if any) and plot at least two points on each piece of the graph.

15. Solve the following inequality.

$$\frac{4}{x} \geq \frac{3}{x + 2}$$

Write your answer as an interval or union of intervals.

16.

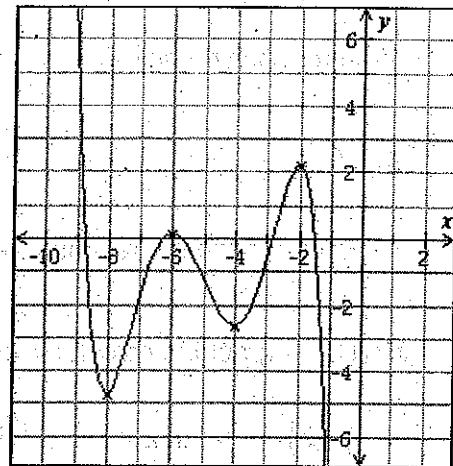
Graph the rational function  $f(x) = \frac{-x^2 + 5x - 5}{x - 2}$ . To graph the function, draw the asymptotes (if any)

and plot at least two points on each piece of the graph.

17. Divide.  $(16 - 13x - 10x^4 - 20x^3 + 9x^2) \div (5x^2 + 3)$

Write your answer in the form  $Q(x) + \frac{R(x)}{5x^2 + 3}$ , where  $Q(x)$  is the quotient and  $R(x)$  is the remainder.

18. Below is the graph of a polynomial function  $f$  with real coefficients. Use the graph to answer the following questions about  $f$ . All local extrema of  $f$  are shown in the graph.



- (a) The function  $f$  is decreasing over which intervals?
- (b) The function  $f$  has local maxima at which  $x$ -values?
- (c) What is the sign of the leading coefficient of  $f$ ?
- (d) Which of the following is a possibility for the degree of  $f$ ?

Choose all that apply. 4 5 6 7 8 9

19. Write the quadratic function in the form  $f(x) = a(x-h)^2 + k$ .

Then, give the vertex of its graph.  $f(x) = -3x^2 + 12x - 13$

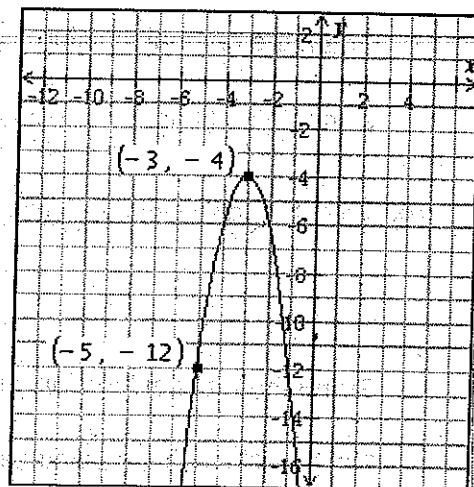
20. Graph the rational function  $f(x) = \frac{-2x^2 + 8x}{x^2 - 6x + 8}$ .

21. Solve the inequality. Write your answer as an interval or union of intervals.  $x^3 - 4x^2 \leq 4x - 16$

22. Find all real zeros of the function.  $g(x) = -5x(x^2 - 25)(x - 7)$

23. Graph the solution to the following inequality on the number line.  $x^2 + 2x \geq 8$

24. Find the equation of the quadratic function  $f$  whose graph is shown



25. Use the remainder theorem to find  $P(-3)$ .

for  $P(x) = 2x^3 + 6x^2 + 9$ .

Specifically, give the quotient and the remainder for the associated division and the value of  $P(-3)$ .