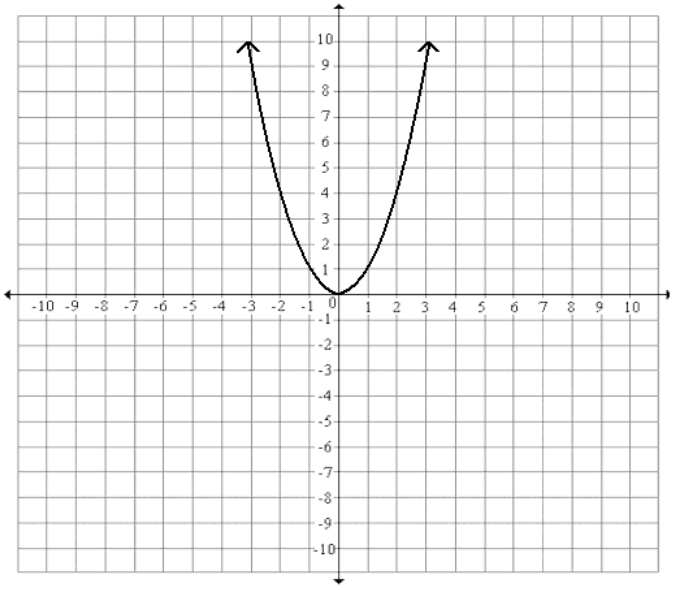
Student's Name _____ Row___ Seat___ Score_____
Date: 3-15-11 Instructor: Dr. Claude S. Moore
SHOW ALL NECESSARY WORK! Section #_____

1. Starting with the graph of $y = x^2$ (pictured), on the same axes, graph the following function $y = -x^2$.



2. Given $g(x) = \begin{cases} 7 & -5 \le x < -2 \\ -2x + 3 & -2 \le x \le 0 \\ -x^2 & x > 0 \end{cases}$

a) Evaluate $\dfrac{g(-3) - 6g(0)}{2g(3)}$

b) Determine the domain of $g(x)$

3. Simplify: (8 – 3i) – (9 – i)

4. Solve $x^2 - 5x - 14 = 0$ by factoring.

5. Solve $x^{\frac{2}{3}} - 3x^{\frac{1}{3}} - 4 = 0$

6. Describe the solutions to $3x^2 - 2x + 6 = 0$. Be as specific as possible.

7. Solve for x (Don't forget to check for extraneous solutions)

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

8. Solve the following inequality. Give your answer in interval notation.

$|5x - 12| > 12$

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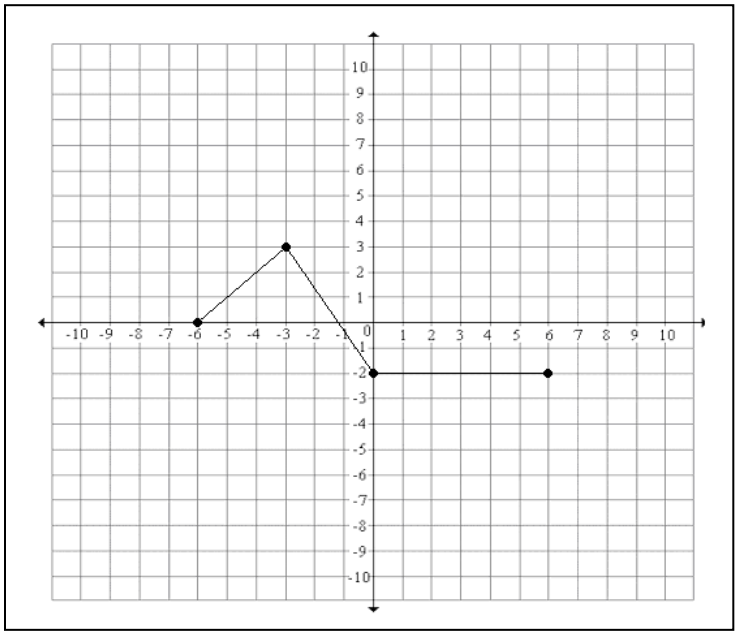
9. Starting with the graph of $y = f(x)$ (pictured) on the same axes graph the following functions
You may find it helpful to use the space provided to find where the individual points go.

$y = -3f(x) + 2$
$(-6,0) \rightarrow$
$(-3,3) \rightarrow$
$(0,-2) \rightarrow$
$(6,-2) \rightarrow$



10. Given $f(x) = x^2 + 3$ and $g(x) = 2 - x$ find $(f - g)(-2)$ and $(f \cdot g)(3)$

11. Given $f(x) = \dfrac{x}{x^2 - 1} + 1$
Is $f(x)$ even, odd, or neither? Show justification for your answer.

12. If x varies inversely with the square of y and $x = 50$ when $y = 2$, find x when $y = 5$.

13. Simplify $\dfrac{4 + i}{-3 - 2i}$

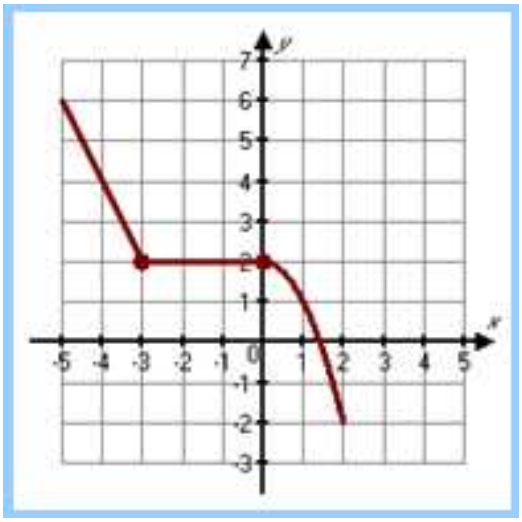
14. Find the axis of symmetry and the vertex for $y = 2x^2 + 10x - 7$.

15. Graph the plane curve and find the rectangular equation and its domain for the parametric equations:
$x = \sqrt{t}$, $y = t + 2; 0 \le t \le 16$

16. Use a graphing calculator for find any relative maximum point of $f(x) = x^3 - 6x^2$

17. A farmer has 1200 meters of fencing. He wants to enclose a rectangular field bordering a river, with no fencing needed along the river. Find the dimensions of the field if the area of the field is 180,000 square meters.

18. Which piecewise function matches the graph?



a. $f(x) = \begin{cases} 2 & for -3 < x \le 0 \\ 2 - x^2 & for\ x > 0 \\ -2x - 4 & for\ x \le -3 \end{cases}$

b. $f(x) = \begin{cases} 2 & for 0 \le x \le 2 \\ 2 - x^2 & for\ x < 0 \\ -2x - 4 & for\ x \ge 2 \end{cases}$

c. $f(x) = \begin{cases} 2 - x^2 & for\ x < 0 \\ 2 & for\ -3 < x \le 0 \\ -2x - 4 & for\ x \le -3 \end{cases}$

d. $f(x) = \begin{cases} -2x - 4 & for\ x \le 2 \\ 2 - x^2 & for\ x > 0 \\ 2 & for\ 0 \le x < 2 \end{cases}$

19. A park in the shape of a rectangle has dimensions 60 *m* by 100 *m*. If the park contains a rectangular garden surrounded by a concrete terrace of uniform width, how wide is the terrace if the area of the garden is 3200 *sq m*?

20. Use a graphing calculator to find the intervals on which the function $f(x) = x^3 + 4x^2$ is increasing.

(a) (-2.7, 0) (b) (0, ∞) (c) (-∞, -2.7) U (0, ∞) (d) (-∞, -2.7)

21. Given that $g(x) = 4x + 3$ and $h(x) = 3x^2 + 2x + 4$, find $(g \circ h)(2)$.

(a) 220 (b) 389 (c) 179 (d) 83

22. Use a graphing calculator to find any relative maximum point of $f(x) = x^3 + 4x^2$

23. Solve $5x^2 - 17x + 6 = 0$.

24. Express $\sqrt{-24}$ in terms of i.

25. Write a paragraph, using complete sentences, to complete the following statement.
In order to successfully complete this course, I …

26. Write a paragraph, using complete sentences, to complete the following statement.
In order to help me successfully complete this course, I want my instructor …

Comments: