

*Precalculus & Honors Precalculus
Summer Review Packet 2011*

This will not be graded.
It is for your benefit only.

The problems in this packet are designed to help you review topics from previous mathematics courses that are important to your success in Precalculus or Honors Precalculus.

Note: Starred questions are for Honors Precalculus only.

It is recommended that you work with one or more people, to review the skills necessary for success in Precalculus. Before you leave school, write down the names, phone numbers, and/or email addresses for at least two people who are also taking Precalculus or Honors Precalculus in the fall.

Name _____ Phone _____

Email _____

Name _____ Phone _____

Email _____

During the summer, answer keys will be posted on the Sherwood website.

Enjoy your summer. We are looking forward to seeing you in the fall.

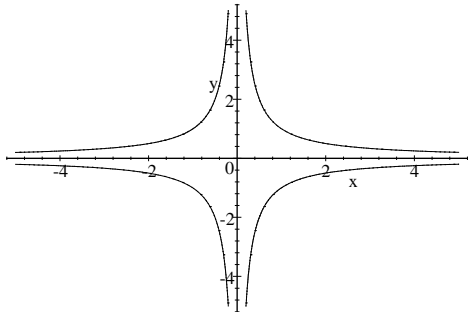
If you have any questions, please contact the math office at (301)924-3253.

1. Which of the following graphs

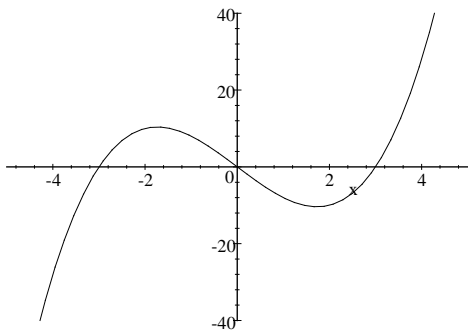
i) Represents a function? Give a reason to your answer.

ii) Represents a 1-1 function? Give a reason to your answer.

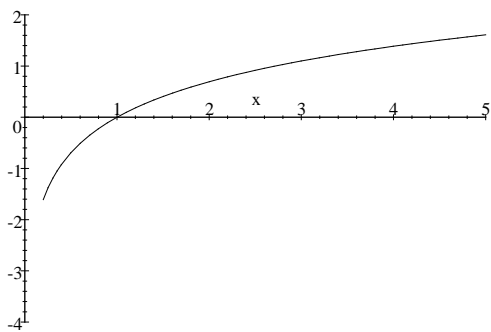
a)



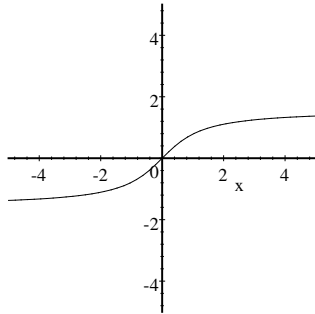
b)



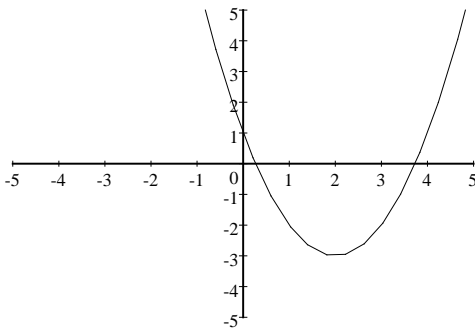
c)



2. Let the following be a graph of a function f . Sketch a graph of the line $y=x$ and a graph of f^{-1} on the same set of axes.



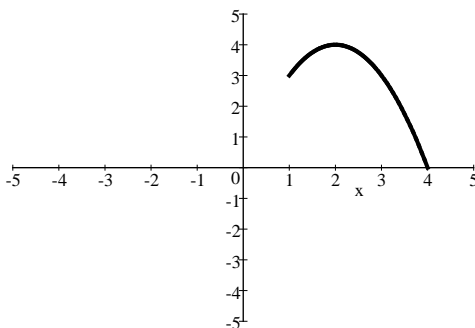
3. Find h and k such that $y = (x-h)^2 + k$ is the equation whose graph is shown below..



4. Graph the following equation and write the exact coordinates of the vertex and x-intercepts:

$$f(x) = 2x^2 - 7x - 4$$

5. What are the domain and the range of the following function if the entire graph is shown (express your answers using interval notation)?



6. Which of the following ordered pairs is a solution of the equation $y = 1 - 2x - x^2$ and which are not. Explain your answer.

$(-1, 2)$ $(2, -7)$ $(0, 1)$ $(1, 3)$

7. Which of the following relations represents a function, and which does not. Give a reason for your answer.

$A = \{(2, 5), (4, 7), (7, 9), (8, 11)\}$

$B = \{(1, 3), (2, 3), (2, 6), (3, 8)\}$

8. Graph and clearly label the set of all points that satisfy $x + 2y \leq 6$.

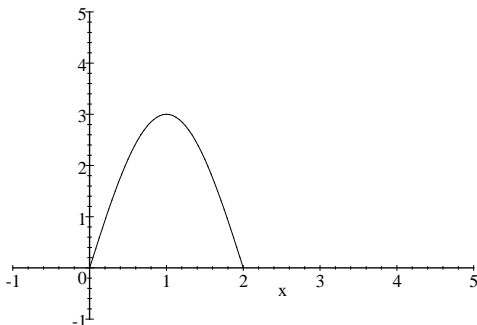
9. For $f(x) = x^2 - 4$ find and simplify $f(t + 2)$.

10. Solve the equation $2x^3 - x^2 - 3x = 0$

11. The equation giving the height of an object thrown upwards starting at 12 feet above the ground is $h(t) = 12 + 40t - 16t^2$

- When will the object reach its maximum height?
- What is its maximum height?
- When will the object hit the ground?

12. The following is a graph of f . Sketch a graph of the equation $y = f(x-1) + 2$ on the same set of axes.



13. Reduce $\frac{x^2 - 2x - 24}{x^2 - 16}$ to lowest terms.

14. Reduce $\frac{4a + 8}{a^2 - 7a - 18} \div \frac{a^2 - a - 6}{a^2 - 81}$ to lowest terms.

15. Divide the polynomial $x^4 + 6x^3 + 6x^2 - 10x - 3$ by $x^2 + 2x - 3$

16. Use the synthetic division to divide the polynomial $f(x) = 3x^3 + 8x^2 + 5x - 7$ by $x+2$.

17. Simplify $\frac{16^{\frac{1}{4}} + 8^{\frac{1}{3}}}{16^{\frac{3}{2}}}$ and give an exact answer.

18. Solve the following equation for x **algebraically**, and verify your answer by substitution.

$$\frac{2}{x} = \frac{3}{x-2} - 1$$

19. Solve the following equation for x **algebraically**

$$2x+1 = \sqrt{13-4x}$$

Verify your solution, by substitution as well as by sketching a graph.

20. Simplify $\frac{4+5i}{1-3i}$ and express the answer in the $a+bi$ form.

21. Write the domains of the following functions in set builder notation.

i) $f(x) = \frac{x}{x^2-1}$ ii) $g(x) = \frac{\sqrt{x-2}}{6}$

22. Solve the system of equations algebraically

$$y = x^2 - 2x - 3$$

$$y = x + 1$$

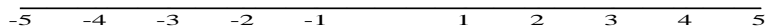
and sketch a graph of the above two equation to verify your solution.

23. Solve the equation $3x^2 - x + 1 = 0$ and write the solutions in $a \pm bi$ form.

24. a) Solve the following compound inequality and write your answer using interval notation:

$$3x - 2 < 4 \text{ and } -4x - 3 \leq 9$$

b) Sketch a graph of the solution set on the number line:



25. Multiply and simplify: $\frac{3x^2 - 27}{x^2 + 5x + 6} \cdot \frac{2x + 6}{x^2 + 6x + 9}$

26. Rationalize the denominators of each of the following:

a) $\frac{3}{\sqrt{2}}$

b) $\frac{2\sqrt{2}}{1 + \sqrt{5}}$

27. Solve for x: $\sqrt{3x - 7} = \sqrt{2x + 1}$

28. Solve for x: $\sqrt[3]{4x - 7} + 5 = 3$

29. Pete is watching his ant farm one afternoon and observes that two ants walk away from each other at a 90 degree angle. After a few seconds, the first ant has traveled 3 inches and the second ant has traveled 4 inches. How far apart are the two ants at that point?

30. Solve for x: $5x^2 - 3 = 122$