

# Summer Review Packet

**You will be expected to be able to have *complete solutions* to each of these problems ready to turn in by the beginning of class on the first day of school this fall.**

**Complete solutions include:**

- The algebra required to solve
- Graphing calculator commands used to solve, and
- Diagrams/sketches where appropriate.

*Unless a problem says “use a graphing utility”, you should solve without the aid of a graphing calculator.*

The topics included in this packet will not be covered in class. They are all topics that have been covered in previous courses.

If you are struggling with a particular problem, you can get help from a variety of sources:

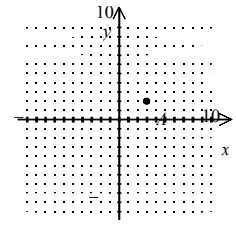
- ✓ Check out an Algebra 2 or PreCalculus book at your local library.
- ✓ Search online for help on the particular topic.
- ✓ Use the Prentice Hall Textbook Site:  
[http://www.phschool.com/atschool/phmath07/program\\_page\\_hs.html](http://www.phschool.com/atschool/phmath07/program_page_hs.html)

We highly recommend that you work at these problems throughout the summer (1/day or 6/week).

**All work should be on these sheets. If additional space is needed, clearly mark and attach it.**

**DO NOT LEAVE THEM UNTIL THE LAST WEEK –  
YOU WILL BE OVERWHELMED.**

1. Name the coordinates of point  $A$  and the quadrant in which  $A$  is located



2. The table shows the amount of time several students spent watching TV and their test grades.

Weekly TV (h)	6	12	18	24	30	36
Grade (%)	87.5	82.5	67.5	72.5	57.5	52.5

Graph the ordered pairs and make a statement about the trend that can be seen.

3. Find the distance between the points:  $(7, 2)$  and  $(-1, 2)$

4.  $M(2, -1)$  is the midpoint of  $\overline{RS}$ . If  $S$  has coordinates  $(7, 4)$ , find the coordinates of  $R$ .

5. Find the center and radius of the circle:  $(x + 5)^2 + (y - 5)^2 = 100$

6. Complete the table. Use the resulting solution points to sketch the graph of the equation.

$$y = x^2 - 2$$

$x$	- 3	- 2	- 1	0	1	2	3
$y$							

7. Use a graphing utility to graph  $y = |x| - 4$ . Approximate any  $x$ - or  $y$ -intercepts of the graph.

8. Use a graphing utility: You own a silk-screening business that prints designs on T-shirts. The model for the average cost per T-shirt is  $\bar{A} = \frac{1.50x + 225}{x}$  where  $x$  is the number of shirts in the production run, \$225 is the one time charge for creating the design and purchasing the supplies, and \$1.50 is the cost of each plain T-shirt. Sketch a graph of the equation and find the average cost per T-shirt for a production run of 450 shirts.

9. Find the slope of the line passing through the pair of points.  $(-2, 5)$ ,  $(8, 6)$

10. Find the general form of the equation of the line that passes through  $(5,1)$  and has slope 0.

11. For  $2x = 3y - 5$  (a) determine the slope and the  $y$ -intercept of the line algebraically, (b) sketch the line by hand, and (c) *use a graphing utility* to verify your answers to parts (a) & (b).

12. Find the slope-intercept form of the equation of the line that passes through the point  $(-4, 5)$  and is perpendicular to the line  $3x + 6y = -6$ .

13. Find the solution to the equation  $-3(x - 1) - 2x = 3x + 2$

14. Find the  $x$ - and  $y$ -intercepts of the graph of the equation  $y = 4x - x^2$

15. Give approximate solution(s) to the equation.  $4 + x^2 = -5x$

16. Determine the point(s) of intersection algebraically. Then verify your result numerically by creating a table of values for each equation.

$$y = 2x^2$$
$$y = -2x^2 + 324$$

17. Solve.  $125x^3 - 64 = 0$

18. Solve.  $\sqrt{x-7} + \sqrt{x} = 4$

19. Solve the inequality.  $-9 < \frac{9-2x}{3} < 9$

20. Graph the solution for the inequality.  $|6x - 3| \leq 9$

21. Solve the inequality and graph the solution on a number line.  $x^3 - 8x \leq 0$

22. Solve the inequality and graph the solution on a number line  $\frac{25}{y} - y > 0$

23. The total amount in a savings account with interest that is compounded yearly is  $A = P(1 + r)^t$  where  $A$  is the amount in an account at the end of an investment period,  $P$  is the principal amount invested,  $r$  is the interest rate, and  $t$  is the time of the investment in years. To the nearest whole percent find the interest rate at which \$3500 grows to at least \$3931 in 2 years.

24. Does the table describe  $y$  as a function of  $x$ ? Explain your reasoning.

Input $x$	-1	0	-1	-4
Output $y$	-1	0	1	2

25. Evaluate the function at the specified value(s) of the independent variable and simplify.

$$f(x) = \begin{cases} \frac{3}{4}x & \text{if } x > -4 \\ -1 + x^2 & \text{if } x \leq -4 \end{cases}$$

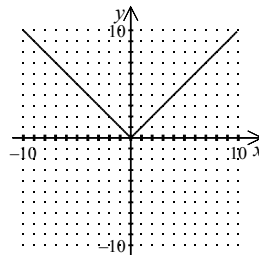
(a)  $f(-4)$                       (b)  $f(0)$   
 (c)  $f(1)$                               (d)  $f(-4.2)$

26. Find the domain of the function.  $f(x) = \frac{\sqrt{x-5}}{x^2 - 6x + 8}$

27. Since 1993, Raul Perez has owned a bookstore called Novel Novellas. The number of books  $B$ , in thousands, that Novel Novellas has sold each year can be modeled by the function  $B(t) = t^2 + 20t + 300$  where  $t$  is the number of years after 1993. Using this model, estimate the number of books sold in 1995.

28. Find the domain and range of the function.  $f(x) = \frac{4}{5}|8 - x|$

29. Use the Vertical Line Test to determine if the graph represents  $y$  as a function of  $x$ .



30. Use a graphing utility to graph the function and visually determine the intervals on which the function is increasing, decreasing, or constant.

$$f(x) = \begin{cases} 4x, & x \leq 2 \\ 8, & 2 < x \leq 6 \\ -\frac{1}{2}x + 11, & x > 6 \end{cases}$$

31. Use a graphing utility to approximate (to two decimal places) any relative minimum or maximum values of the function.

$$y = -9x^2 + 4x$$

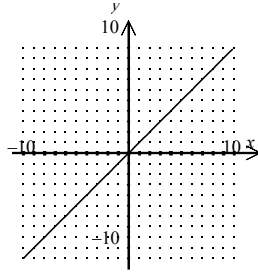
32. Graph the function.

$$f(x) = \begin{cases} 3, & x < -2 \\ x^2 + 4x + 4, & x \geq -2 \end{cases}$$

33. Determine whether the function is even, odd, or neither.

$$f(x) = -x^6 + 2x^2 + 2$$

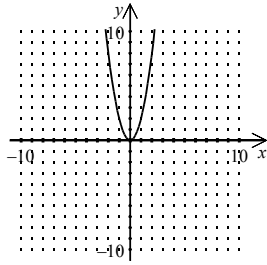
34. Identify the common function type shown in the graph.



35. Given  $f(x) = x^2$ , consider the translation 3 units to the right and 2 units upward. Give the translated function and its graph.

36. Graph the pair of functions and identify the transformation.  $f(x) = |x| - 4$ ,  $g(x) = |-x| - 4$

37. Write an equation for the function whose graph is shown.



38. Evaluate  $(f - g)(x)$  for  $f(x) = 2x + 5$  and  $g(x) = x - 4$ .

39. If  $f(x) = x + 5$  and  $g(x) = \sqrt{x - 6}$ , find  $(f \circ g)(x)$ .

40. The production in board feet and the cost of manufacturing lumber at a sawmill are  $P(h) = 300h$  and  $C(n) = 0.2n + 9000$  where  $P(h)$  is the number of board feet that can be produced in  $h$  hours and  $C(n)$  is the cost of producing  $n$  board feet. Find  $(C \circ P)(h)$  and interpret its meaning.

41. Find the inverse of  $f(x) = 7x$  informally. Verify that  $f(f^{-1}(x)) = x$  and  $f^{-1}(f(x)) = x$ .

42. Use a graphing utility to graph the function  $f(x) = x^2 + 4$  and use the Horizontal Line Test to determine whether the function has an inverse.

43. Find the inverse of the function.  $f(x) = \frac{x+2}{6}$