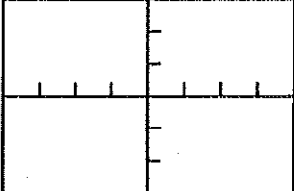
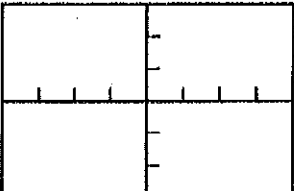
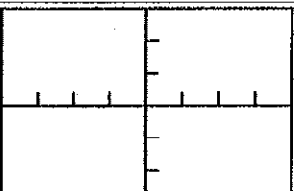
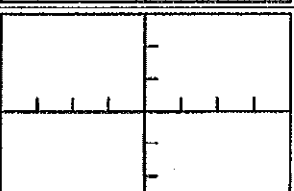
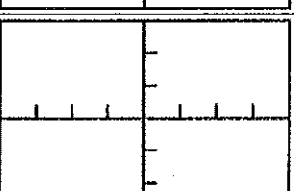
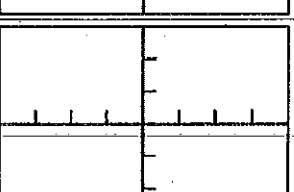
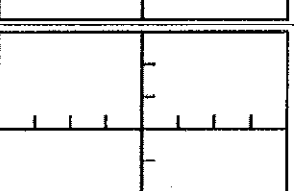


Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

AP Calculus Summer Work

I understand that:

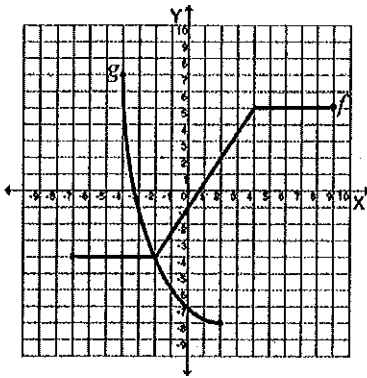
- I am responsible for obtaining and completing the AP Calculus Summer Work packet
- this will be collected in class on the first day
- in order to receive full credit for this assignment, I must show all work.
- 

Function	Graph (clearly indicate units)	Domain	Range	Even, Odd, or neither?	Is $f(x)$ a one-to-one function?
$f(x) = x^2$					
$f(x) = x^3$					
$f(x) =  x $					
$f(x) = \sqrt{x}$					
$f(x) = \frac{1}{x}$					
$f(x) = \sin x$					
$f(x) = \cos x$					

# 1 – 3 Write the equation of each line described in POINT-SLOPE FORM.  $y - y_1 = m(x - x_1)$

1. Passes through (2, -1) and has slope  $-\frac{1}{3}$
2. Passes through (-1, -2) and is parallel to  $y = \frac{3}{5}x - 1$
3. Passes through (4, -3) and is perpendicular to  $3x + 2y = 4$

# 4 – 7 Use the graph below.



4. Identify the domains and ranges of  $f$  and  $g$ .
5. Identify  $f(4)$  and  $g(-4)$ .
6. For what value(s) of  $x$  is  $f(x) = g(x)$ ?
7. Estimate the solution(s) of  $g(x) = -1$ .

# 8 – 12 Find the domain of each function.

denominator  $\neq 0$  ; radicand of even roots must be  $\geq 0$  ; argument of a log must be  $> 0$

8.  $f(x) = \frac{3x^2}{13-x}$

9.  $g(x) = \sqrt{5x-7}$

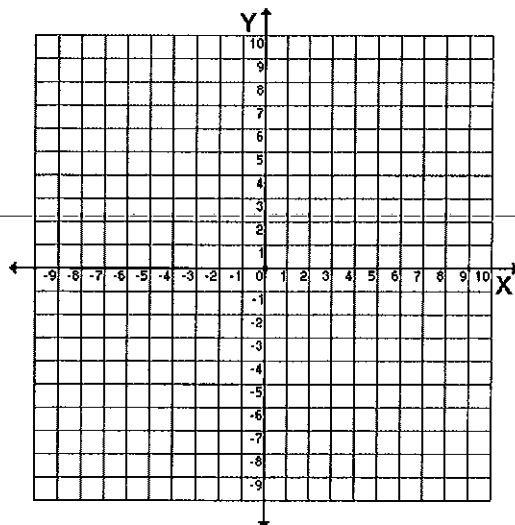
10.  $h(x) = \frac{|x|}{\sqrt{x-11}}$

11.  $k(x) = \sqrt{x^2 + 9x + 14}$

12.  $\log(x+12)$

# 13 – 19 Use the piecewise function  $f(x) = \begin{cases} -2x-1, & x < 1 \\ x^2+2, & x \geq 1 \end{cases}$

13. Sketch a graph of the function.



Evaluate:

14.  $f(5)$

15.  $f(-7)$

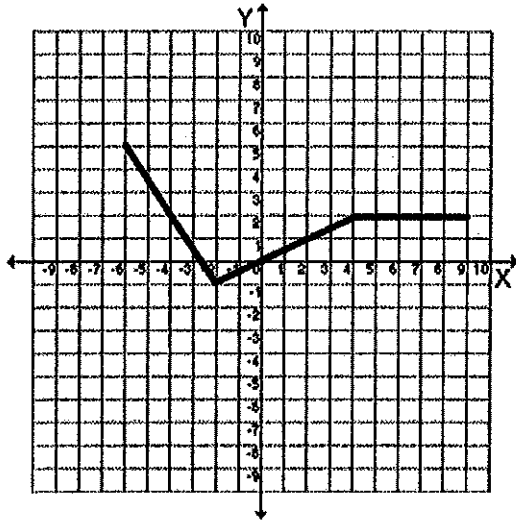
16.  $f(1)$

17. Determine the domain and range.

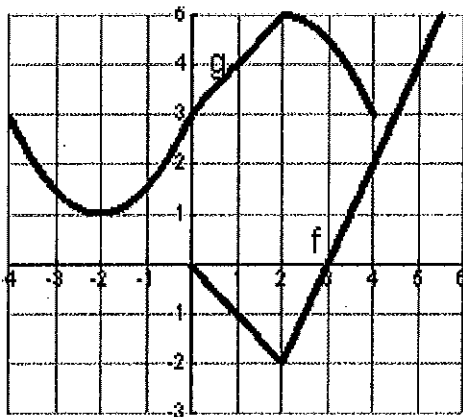
18. Is  $f(x)$  continuous at  $x = 1$ ?

19. Is  $f(x)$  continuous at  $x = -1$ ?

20. Write the piecewise function that defines the graph below.



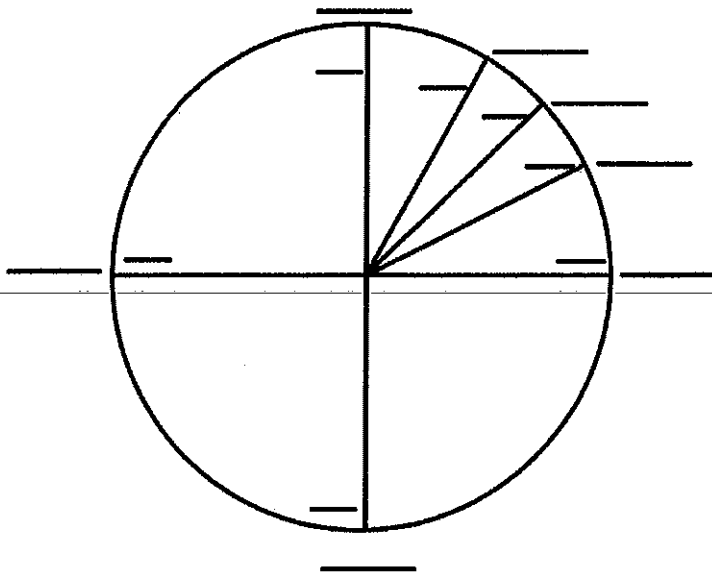
# 21 – 25 Use the given graphs of  $f$  and  $g$  to evaluate each expression.  $(f \circ g)(x) \Leftrightarrow f(g(x))$



Example: find  $(g \circ f)(2) = g(f(2)) = g(2) = 1$

21.  $g(f(0))$
22.  $f(g(2))$
23.  $(f \circ g)(0)$
24.  $(g \circ f)(4)$
25.  $(g \circ g)(-2)$

26. Fill in the radian measure and coordinates for the indicated values on the unit circle. (no calculator)



#27 - 32 Evaluate (without a calculator).

27.  $\arctan(1)$                       28.  $\sin^{-1}\left(\frac{1}{2}\right)$                       29.  $\arccos\left(\frac{1}{2}\right)$
30.  $\tan^{-1}(-\sqrt{3})$                       31.  $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$                       32.  $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

# 33 – 34 Factor.

33.  $x^3 - 8$                       34.  $1000x^3 + 1$

# 35 – 37 Simplify. (no answers with negative or rational exponents)

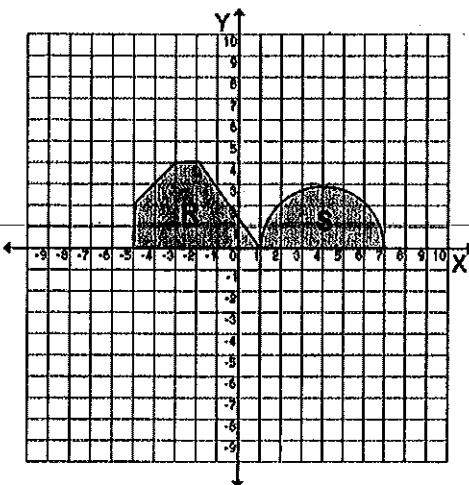
Example:  $\frac{13x^{-5} + 8x^3}{2\sqrt{x}} = \frac{1}{2}x^{-1/2}(13x^{-5} + 8x^3) = \frac{13}{2}x^{-11/2} + 4x^{5/2} = \frac{13}{2\sqrt{x^{11}}} + 4\sqrt{x^5}$

35.  $\frac{5x^{-2} + 12x^3 - x}{x^2}$                       36.  $\sqrt{x}(7\sqrt{x} - 2x^3)$                       37.  $\frac{10\sqrt{x} - x^2}{2\sqrt[3]{x}}$

# 38 – 47 Write the formula used to find each of the following:

38. Area of a square                      39. Area of a rectangle                      40. Area of a trapezoid
41. Area of a circle                      42. Area of a semicircle                      43. Circumference of a circle
44. Volume of a cube                      45. Volume of a cylinder                      46. Volume of a sphere
47. Surface area of a cube

# 48 – 49 Use the figure below.



48. Find the area of region R.

49. Find the area of region S.

# 50 – 57 Find the limit.

50.  $\lim_{x \rightarrow 4} (x+3)^2$

51.  $\lim_{x \rightarrow 0} \frac{x}{x^2 - x}$

52.  $\lim_{x \rightarrow 2} \frac{1}{x}$

53.  $\lim_{x \rightarrow 4} \frac{x-4}{x^2-16}$

54.  $\lim_{x \rightarrow 3} \frac{x^2+x-6}{x^2-9}$

55.  $\lim_{x \rightarrow 1} \frac{x}{x^2+4}$

56.  $\lim_{x \rightarrow 4} \frac{\sqrt{x+5}-3}{x-4}$

57.  $\lim_{x \rightarrow 2} \frac{x^3+8}{x+2}$

58.  $\lim_{x \rightarrow \frac{\pi}{2}} \sin x$

# 59 – 70 Use the graph of  $f(x)$  below.

59. Find  $f(-7)$

60. Find  $f(2)$

61. Find  $\lim_{x \rightarrow -7} f(x)$

62. Find  $\lim_{x \rightarrow 2^-} f(x)$

63. Find  $\lim_{x \rightarrow 2^+} f(x)$

64. Find  $\lim_{x \rightarrow 2} f(x)$

65. Find  $\lim_{x \rightarrow 6^+} f(x)$

66. Find  $\lim_{x \rightarrow -1} f(x)$

67. Is  $f$  continuous at  $-1$ ?

68. Is  $f$  continuous at  $-7$ ?

69. Is  $f$  continuous at  $2$ ? \_\_\_\_\_

70. Is  $f$  continuous at  $6$ ? \_\_\_\_\_

