

Complete the following. Show and attach all work in a clear manner. Do NOT do any work on this sheet – all work must be separate. Clearly indicate your final answer on the answer sheet provided. Have this assignment completed and ready to turn in on the first day of school.

1. Are the following statements true? If not, why not?

a)  $\frac{2k}{2x+h} = \frac{k}{x+h}$

b)  $\frac{1}{p+q} = \frac{1}{p} + \frac{1}{q}$

c)  $\frac{x+y}{2} = \frac{x}{2} + \frac{y}{2}$

d)  $3\frac{a}{b} = \frac{3a}{3b}$

e)  $3\frac{a}{b} = \frac{3a}{b}$

f)  $3\frac{a+b}{c} = \frac{3a+b}{c}$

2. Simplify: a)  $\frac{\frac{x}{2}}{\frac{x}{4}}$

b)  $h \div \frac{(x+h)}{h}$

c)  $\frac{\sqrt{x-2} + \frac{5}{\sqrt{x-2}}}{x-2}$

3. Solve  $xy' + y = 1 + y'$  for  $y'$

4. Solve the quadratic equation:  $4x^2 - 21x - 18 = 0$

5. Solve:  $\frac{7x^2 + 5x}{x^2 + 1} - \frac{5x}{x^2 - 6} = 0$

6. Graph the equation  $y = x^3 - x$  and answer the following questions.

- a) Is the point (3, 2) on the graph?
- b) Is the point (2, 6) on the graph
- c) Is the function even, odd, or neither?
- d) What is the y intercept?
- e) Find the x intercepts.

7. Find the equation of the straight line that passes through the point (2, 4) and is parallel to the line  $2x + 3y - 8 = 0$ .

8. Find the equation of the line that is perpendicular to the line  $2x + 3y - 8 = 0$  at the point (1,2)

9. The line with the slope 5 that passes through the point (-1,3) intersects the x axis at a point. What are the coordinates of this point?

10. What are the coordinates of the point at which the line passing through the points (1, -3) and (-2,4) intersects the y axis?

11. Given  $f(x) = |x - 3| - 5$  find  $f(1) - f(5)$

12. Given  $f(x) = x^2 - 3x + 4$  find  $f(x+2) - f(2)$

13. Find the domain for each of the following functions.

a)  $f(x) = x^{20}$       b)  $g(x) = \frac{1}{x-3}$       c)  $h(x) = \frac{1}{4x^2 - 21x - 18}$       d)  $k(x) = \sqrt{4x^2 - 21x - 18}$   
e)  $p(x) = \frac{1}{\sqrt{4x^2 - 21x - 18}}$

14. Find  $f(x + \Delta x)$  for  $f(x) = x^2 - 2x - 3$ .

15. Find  $\frac{f(x + \Delta x) - f(x)}{\Delta x}$  if  $f(x) = 8x^2 + 1$

16. Given  $f(x) = \frac{1}{x}$  Find:  $\frac{f(x+h) - f(x)}{h}$

17. Sketch the graph of each function

$$f(x) = \begin{cases} 1 & x \leq 0 \\ -1 & x > 0 \end{cases} \qquad f(x) = \begin{cases} 2x & (-\infty, -1) \\ 2x^2 & [-1, 2) \\ -x+3 & (2, \infty) \end{cases}$$

18. Given  $f(x) = x - 3$  and  $g(x) = \sqrt{x}$  complete the following

a)  $f(g(x)) =$       b)  $g(f(x)) =$       c)  $f(f(x)) =$

19. Given  $f(x) = \frac{1}{x-5}$  and  $g(x) = x^2 - 5$  complete the following

a)  $f(g(7)) =$       b)  $g(f(s)) =$       c)  $g(g(x)) =$

20. Let  $f(x) = 2x - 2$ . Complete the following: A) Sketch the graph of  $f(x)$ . B) Determine whether  $f$  has an inverse function. C) Sketch the graph of  $f^{-1}(x)$  D) Give the equation for  $f^{-1}(x)$

21. Rewrite with fractional exponents: A)  $\sqrt{1+x^2}$       B)  $\frac{1}{\sqrt{(1+z^2)^3}}$

22. Sketch the graph of  $y = 2^x$  and give its domain and range.

23. Find the surface area of a box of height  $h$  whose base dimensions are  $p$  and  $q$ , and that satisfies the following condition:

- A) The box is closed
- B) The box has an open top
- C) The box has an open top and a square base.

24. A seven foot ladder, leaning against a wall, touches the wall  $x$  feet above the ground. Write an expression (in terms of  $x$ ) for the distance from the foot of the ladder to the base of the wall.

25. A piece of wire 5 inches long is to be cut into two pieces. One piece is  $x$  inches long and is to be bent into the shape of a square. The other piece is to be bent into the shape of a circle. Find an expression for the total area made up by the square and the circle as a function of  $x$ .

**26. Evaluate:**

- A)  $\cos 0$       B)  $\sin 0$       C)  $\tan \frac{\pi}{2}$       D)  $\cos \frac{\pi}{4}$       E)  $\sin \frac{\pi}{2}$   
 F)  $\sin \pi$       G)  $\arccos \frac{\sqrt{3}}{2}$       H)  $\arctan 1$

**27-29. Find the solution of the equations for  $0 \leq x \leq 2\pi$**

27.  $2 \sin^2 \theta = 1 - \sin \theta$       28.  $2 \tan \theta - \sec^2 \theta = 0$       29.  $\sin 2\theta + \sin \theta = 0$

**30. Which of the following expressions are identical? A)  $\cos^2 x$  B)  $(\cos x)^2$  C)  $\cos x^2$**

**31. Which of the following expressions are identical?**

- A)  $(\sin x)^{-1}$       B)  $\arcsin x$       C)  $\sin x^{-1}$       D)  $\frac{1}{\sin x}$

**32. Solve for x, round to 3 decimal places.**

- A.  $\log_2 x = 3$       B.  $\log_{\frac{1}{2}} x = 4$       C.  $\log_3 81 = x$   
 D.  $\log_3(-9) = x$       E.  $\log_x 16 = -4$       F.  $2^x = 3$   
 G.  $2.43 \cdot 10^x = 1.84$       H.  $\ln(x+5) = \ln(x-1) - \ln(x+1)$

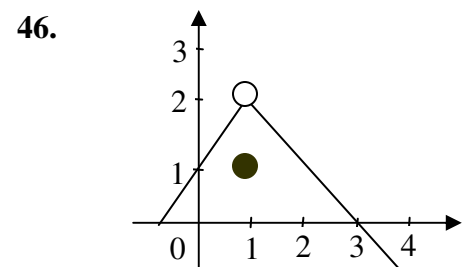
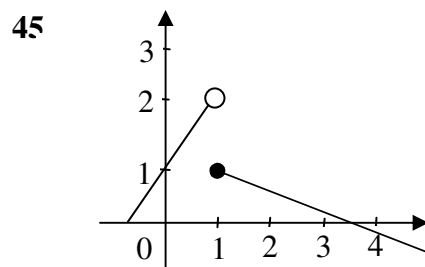
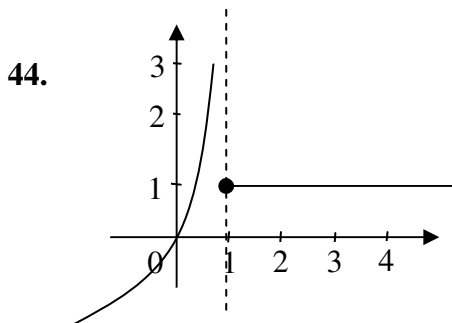
33.  $\lim_{x \rightarrow 3} (x^2 + 2)$       34.  $\lim_{x \rightarrow -3} \frac{(x+3)(x-4)}{(x+3)(x+1)}$       35.  $\lim_{x \rightarrow 25} \frac{\sqrt{x}-5}{x-25}$   
 36.  $\lim_{x \rightarrow -2} \frac{x-4}{x^2-2x-8}$       37.  $\lim_{x \rightarrow -3} \frac{x^2+2x-3}{x^2+7x+12}$       38.  $\lim_{x \rightarrow -2} \frac{x^3+8}{x+2}$   
 39.  $\lim_{x \rightarrow 5} \frac{x-5}{|x-5|}$       40.  $\lim_{x \rightarrow 8} \frac{1}{x-8}$

**41-46 For each of the following determine a)  $\lim_{x \rightarrow 1^-} f(x)$  b)  $\lim_{x \rightarrow 1^+} f(x)$  and c)  $\lim_{x \rightarrow 1} f(x)$**

41.  $f(x) = \begin{cases} x^2 - 1 & x < 1 \\ 4 - x & x \geq 1 \end{cases}$

42.  $f(x) = \begin{cases} 3x - 1 & x \leq 1 \\ 3 - x & x > 1 \end{cases}$

43.  $f(x) = \begin{cases} x^2 & x < 1 \\ 2 & x = 1 \\ x - 2 & x > 1 \end{cases}$



AP Calculus  
Summer Assignment  
Answer Sheet

Name \_\_\_\_\_  
Pd \_\_\_\_\_

1a) \_\_\_\_\_

1b) \_\_\_\_\_

1c) \_\_\_\_\_

1d) \_\_\_\_\_

1e) \_\_\_\_\_

1f) \_\_\_\_\_

2a) \_\_\_\_\_

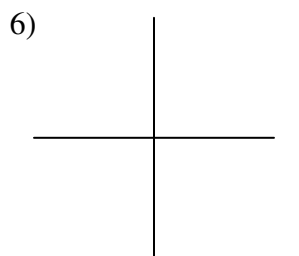
2b) \_\_\_\_\_

2c) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_



6a) \_\_\_\_\_

6b) \_\_\_\_\_

6c) \_\_\_\_\_

6d) \_\_\_\_\_

6e) \_\_\_\_\_

7) \_\_\_\_\_

8) \_\_\_\_\_

9) \_\_\_\_\_

10) \_\_\_\_\_

11) \_\_\_\_\_

12) \_\_\_\_\_

13a) \_\_\_\_\_

13b) \_\_\_\_\_

13c) \_\_\_\_\_

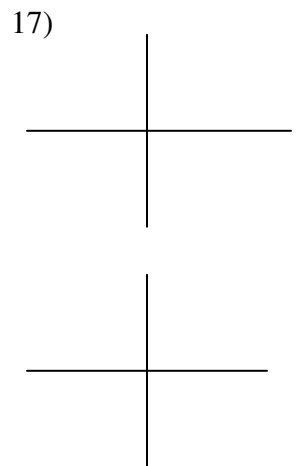
13d) \_\_\_\_\_

13e) \_\_\_\_\_

14) \_\_\_\_\_

15) \_\_\_\_\_

16) \_\_\_\_\_



18a) \_\_\_\_\_

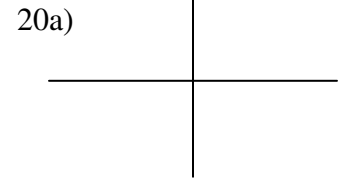
18b) \_\_\_\_\_

18c) \_\_\_\_\_

19a) \_\_\_\_\_

19b) \_\_\_\_\_

19c) \_\_\_\_\_



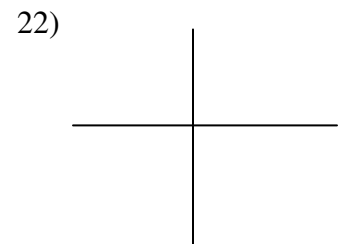
20b) \_\_\_\_\_

20c) \_\_\_\_\_

20d) \_\_\_\_\_

21a) \_\_\_\_\_

21b) \_\_\_\_\_



22) domain \_\_\_\_\_

range \_\_\_\_\_

23a) \_\_\_\_\_

23b) \_\_\_\_\_

23c) \_\_\_\_\_

24) \_\_\_\_\_

25) \_\_\_\_\_

26a) \_\_\_\_\_

26b) \_\_\_\_\_

26c) \_\_\_\_\_

26d) \_\_\_\_\_

26e) \_\_\_\_\_

26f) \_\_\_\_\_

26g) \_\_\_\_\_

42a) \_\_\_\_\_

26h) \_\_\_\_\_

42b) \_\_\_\_\_

27) \_\_\_\_\_

42c) \_\_\_\_\_

28) \_\_\_\_\_

43a) \_\_\_\_\_

29) \_\_\_\_\_

43b) \_\_\_\_\_

30) \_\_\_\_\_

43c) \_\_\_\_\_

31) \_\_\_\_\_

44a) \_\_\_\_\_

32a) \_\_\_\_\_

44b) \_\_\_\_\_

32b) \_\_\_\_\_

44c) \_\_\_\_\_

32c) \_\_\_\_\_

45a) \_\_\_\_\_

32d) \_\_\_\_\_

45b) \_\_\_\_\_

32e) \_\_\_\_\_

45c) \_\_\_\_\_

32f) \_\_\_\_\_

46a) \_\_\_\_\_

32g) \_\_\_\_\_

46b) \_\_\_\_\_

32h) \_\_\_\_\_

46c) \_\_\_\_\_

33) \_\_\_\_\_

34) \_\_\_\_\_

35) \_\_\_\_\_

36) \_\_\_\_\_

37) \_\_\_\_\_

38) \_\_\_\_\_

39) \_\_\_\_\_

40) \_\_\_\_\_

41a) \_\_\_\_\_

41b) \_\_\_\_\_

41c) \_\_\_\_\_

