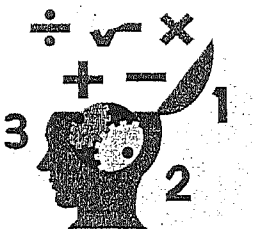
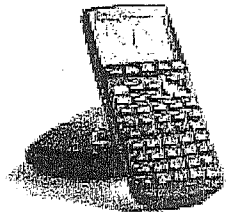


Dear_____

Attached is your **Summer Assignment** (two parts) for AP Calculus, which is due the first day of school next year. If you do not complete the assignment over the Summer, you will be scheduled out of AP Calculus. We will have a test on Part 1 of the Summer Assignment during the first week of school and a test on Part 2 during the second week of school.

You will need a **graphing calculator** for this course, as it is required for the AP test. The TI-83 Plus is probably your most economical choice. The TI-83 Plus Silver Edition and the TI-84 are also fine, but are somewhat more expensive. Ebay and Amazon.com offer the calculator at reasonable prices. Also, Staples and Office Depot usually put the TI- 83 Plus Calculator on sale in August.

Ms. Leopold
rleopold@
pgcps.org



PART I

Name_____

AP Calculus Summer Assignment

A) Solve for x.

1. $3x - 6 = 18$
2. $4 - 3(x + 2) = 8x$
3. $(4/3)x + 8 = 12$

B) Simplify

4. $\frac{8x^2y^3}{4xy}$
5. $(3x^2y^3)^4$
6. $(118xy)(3xy^3)$
7. $6ab(4a^2b - 3a)$

C) Rewrite without negative exponents

8. x^{-8}
9. $(x^{-12})(x)$
10. x^{-1}

D) Factor Completely

11. $x^2 - 25$
12. $x^4 - 16$
13. $x^2 + 5x + 4$
14. $x^2 - 4x - 5$
15. $5x^2 - 13x - 6$
16. $2x^2 + 11x + 5$

E) Multiply

17. $(x + 5)(x - 2)$

18. $(x + 5)(x - 5)$

F) Use $f(x) = x^3 + 2x - 1$ and $g(x) = x + 2$

19. f(3)

20. f(-2)

21. g(5)

22. f(g(1))

23. g(f(2))

24. g(f(x))

G) Complete the Pythagorean triples. Use $a^2 + b^2 = c^2$.

	a	b	c
25.	3	4	
26.		24	25
27.	5	12	
28.	8		17
29.	6	8	

H) Linear Equations. Use $y = mx + b$ and $y - y_1 = m(x - x_1)$.

30. Find the slope, x-intercept and y- intercept of: a) $y = 6x - 8$
b) $4x + 12y = 24$

31. Find an equation of the line with slope 10 through (5,7.)

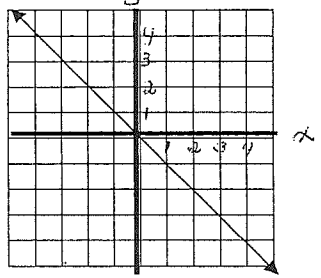
32. Parallel lines have_____ slopes.

33. A line perpendicular to the line $y = 6x + 5$ would have a slope of_____.

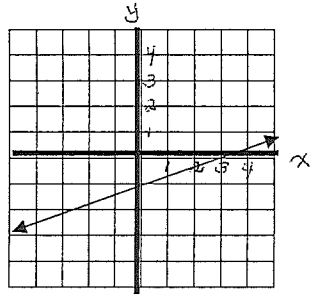
34. Find the slope of the line through the points.
   a. (2,7) and (8,6)
   b. (8,4) and (8,2)
   c. (7,3) and (10,3)

35. Find the slope, x-intercept and y-intercept of the lines shown below.

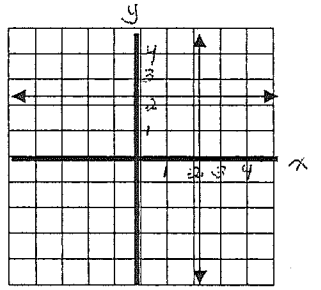
a)



b)



c)



I) Solve for x.

36. $x^2 + 2x + 1 = 0$

37. $3x^2 + 6x = 0$

38. $4x^2 - 8 = 0$

39. $x^2 + 5 = 0$

40. $8(x + 5)^2(x - 6)^5 - 2(x + 5)^3(x - 6)^4 = 0$

J) Solve the inequality.

41. $x + 3 \leq 5$

42. $2x - 4 \geq 0$

43. $-3x \geq 9$

44. $x^2 + 5x + 4 > 0$

45. $x^2 - 8x - 9 \leq 0$

46. $x^2 + 4x - 21 > 0$

K) Simplify.

47. $|-4|$

48. $|3 - 4|$

49. $\sqrt{25}$

50. $\sqrt{50}$

51. $\sqrt{16/121}$

L) Solve for x.

52 $\frac{x}{5} = \frac{7}{8}$

53. $\frac{x}{4} = \frac{9}{12}$

54. $\frac{x-3}{2} = \frac{4}{x-2}$

M) Simplify each expression.

55. $\frac{8n^4 + 6n^2 - 4n}{2n}$

56. $\frac{20x^2 + 30}{4x^2 + 6}$

57. $\frac{3/7}{8/5}$

58. $\frac{1 + ½}{2 - 1/3}$

59. $4[2 - 5(8 - 7)]$

60. $2x + 4(x - 3y) - y$

N) Let x = 4 and y = -4

61. $2x - y =$

62. $\frac{1}{x-4} =$

63. $x(y)^2 =$

O) Notation for Inequalities

Fill out the chart below.

	Interval Notation	Set Notation
Example 1	$X \leq 5$	$(-\infty, 5]$
Example 2	$X > 3$	$(3, \infty)$
64)	$X \leq -2$	
65)		$(4, \infty)$
66)	$X > 8$	
67)	$-3 \leq x \leq 10$	

P) The Distance Formula

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Find the distance between the given points.

68. (3, 7) and (4, 8)

69. (1, -1) and (3, 11)

Q) Solving systems of equations. Solve for x and y.

70. $x^2 - y = 3$
$x - y = 1$

71. $x + y = 2$
$2x - y = 1$

R) Distance = Rate x Time

72. How many miles are traveled by a car going 85 mph for 2 hours?

73. How long will it take a car traveling at 35 mph to go 7 miles?

74. What was the speed of a car which traveled 100 miles in 4 hours?

S) Fractional Exponents. Simplify the following.

75. $8^{1/3}$

76. $4^{3/2}$

77. $25^{1/2}$

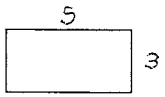
78. $100^{-1/2}$

79. $8^{-1/3}$

T) Areas and Volumes

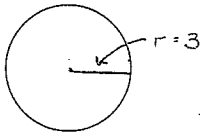
80) Find the area

a.

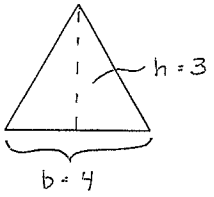


b.

c.

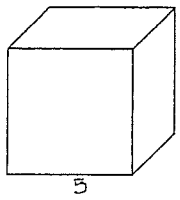


d.

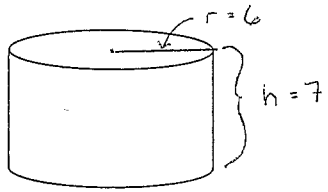


81) Find the volume.

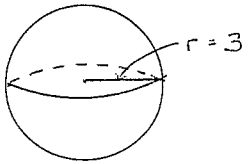
a. Cube



b. Cylinder



c. Sphere



82) Find the surface area of each of the figures above.

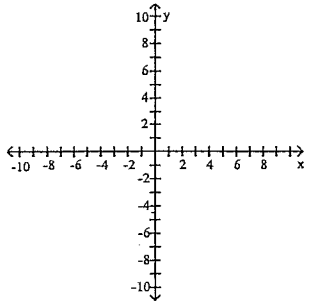
Name_____

PART II

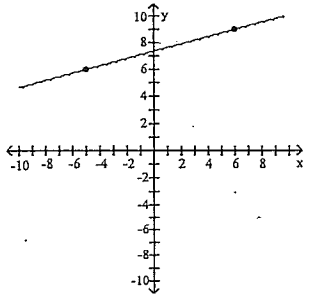
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Plot the points and find the slope (if any) of the line they determine.

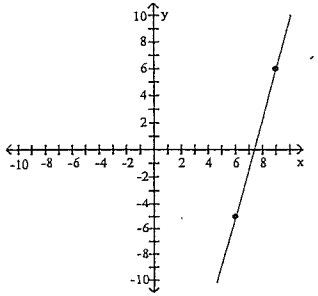
1) A(9, 6), B(6, -5) 1) _____



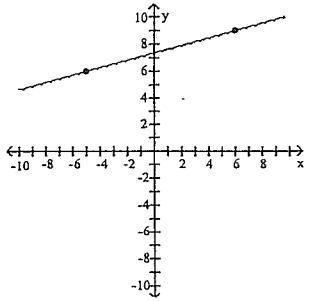
A) $m = \frac{3}{11}$



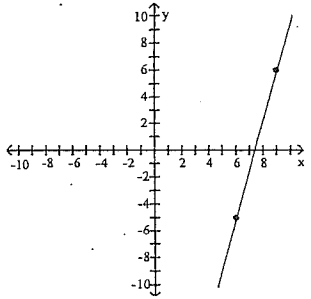
B) $m = \frac{3}{11}$



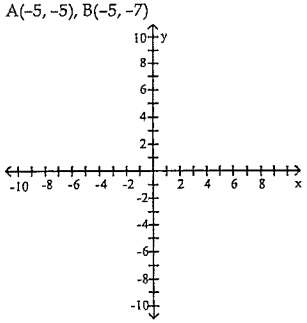
C) $m = \frac{11}{3}$



D) $m = \frac{11}{3}$

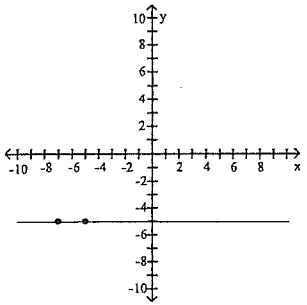


2) A(–5, –5), B(–5, –7)

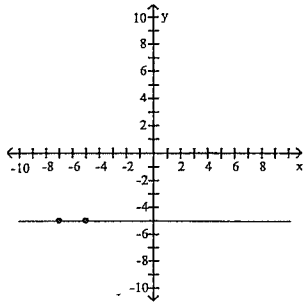


2) _____

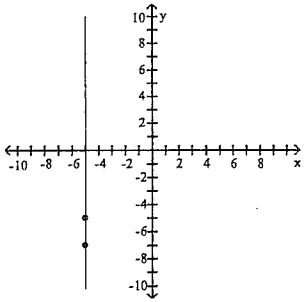
A) m = 0



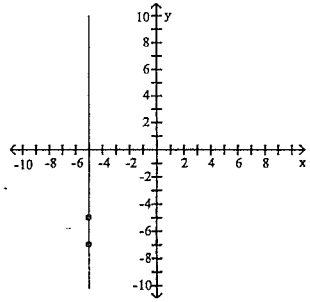
B) m is undefined.



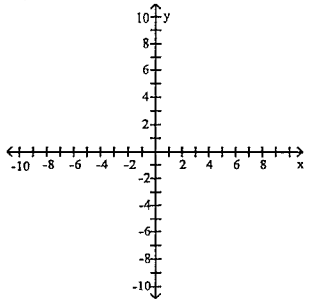
C) m is undefined.



D) m = 0

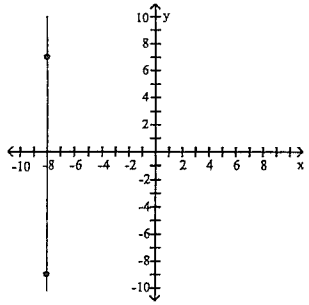


3) A(–9, –8), B(7, –8)

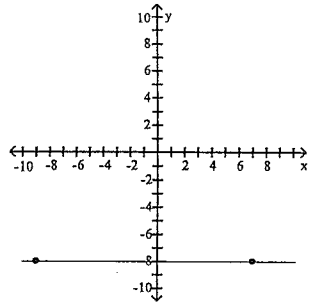


3) _____

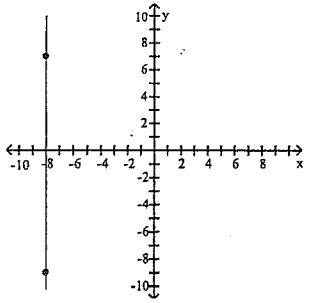
A) m = 0



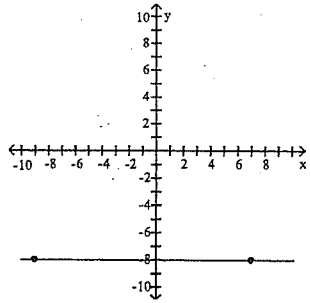
B) m = 0



C) m is undefined.



D) m is undefined.



Find an equation for the vertical line and the horizontal line through the given point.

4) $\left(1, \frac{2}{9}\right)$ 4) _____

A) $x = 1$, $y = \frac{9}{2}$ B) $x = \frac{2}{9}$, $y = 1$ C) $x = -1$, $y = \frac{2}{9}$ D) $x = 1$, $y = \frac{2}{9}$

Write an equation for the line described.

5) Passes through (–1, 2) with slope 1 5) _____

A) $y = x - 3$ B) $y = x + 3$ C) $y = x + 1$ D) $y = -x + 3$

6) Passes through (–7, –6) and has slope 0 6) _____

A) $y = -7$ B) $y = -6$ C) $x = -7$ D) $x = -6$

7) Passes through (–4, 9) and has no slope 7) _____

A) $x = 9$ B) $y = 9$ C) $y = -4$ D) $x = -4$

8) Passes through (3, –1) and (–2, 7) 8) _____

A) $y = -\frac{4}{9}x + \frac{55}{9}$ B) $y = -\frac{8}{5}x + \frac{19}{5}$ C) $y = \frac{8}{5}x + \frac{19}{5}$ D) $y = \frac{4}{9}x + \frac{55}{9}$

9) Has y-intercept –3 and x-intercept –8 9) _____

A) $y = -\frac{8}{3}x + 3$ B) $y = -\frac{8}{3}x - 3$ C) $y = -\frac{3}{8}x - 3$ D) $y = -\frac{3}{8}x + 3$

10) Passes through (–5, –7) and is parallel to the line $-5x + 2y = 27$ 10) _____

A) $y = \frac{5}{2}x + \frac{27}{2}$ B) $y = \frac{2}{5}x + \frac{7}{5}$ C) $y = -\frac{5}{2}x - \frac{11}{2}$ D) $y = \frac{5}{2}x + \frac{11}{2}$

11) Passes through (1, –5) and perpendicular to the line $-7x - 5y = 18$ 11) _____

A) $y = \frac{5}{7}x$ B) $y = -\frac{5}{7}x - \frac{40}{7}$ C) $y = \frac{5}{7}x - \frac{40}{7}$ D) $y = \frac{7}{5}x - 40$

Find the slope and the y-intercept of the line.

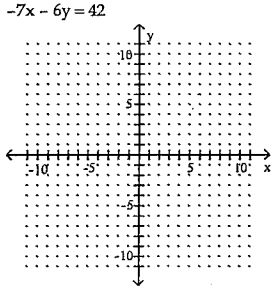
12) $2x + 4y = 22$ 12) _____

A) m = 2; y-intercept: $\left(0, \frac{11}{2}\right)$ B) m = – 2; y-intercept: (0, 4)

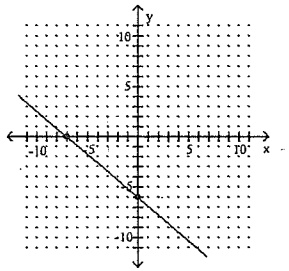
C) $m = \frac{1}{2}$; y-intercept: (0, 22) D) $m = -\frac{1}{2}$; y-intercept: $\left(0, \frac{11}{2}\right)$

Graph the line.

13) $-7x - 6y = 42$ 13) _____



A)



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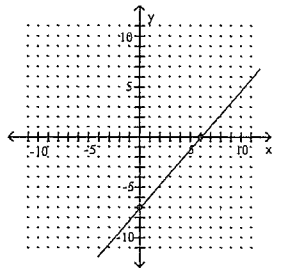

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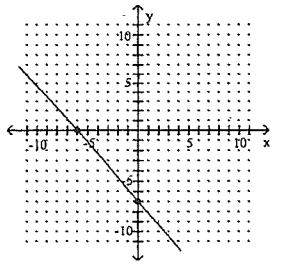

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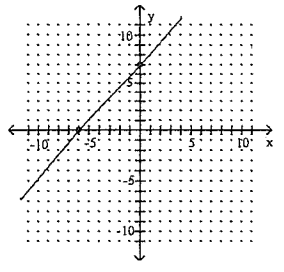
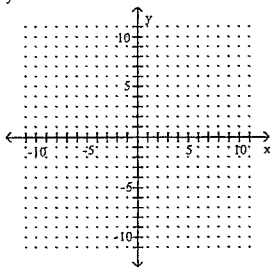
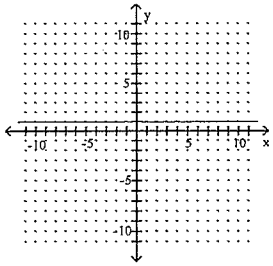


14) $y = 1$ 14) _____



A)



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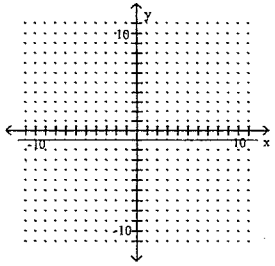

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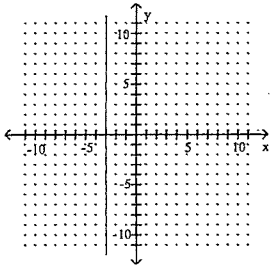

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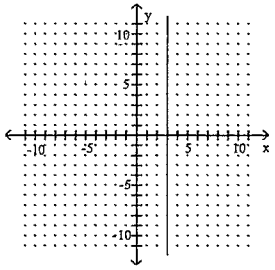
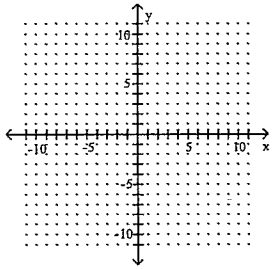
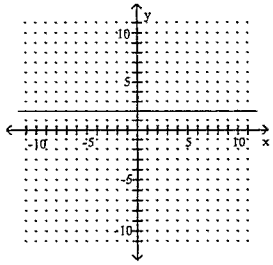


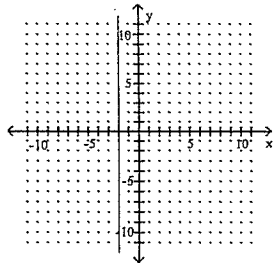
15) $x = -2$ 15) _____



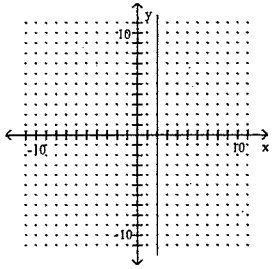
A)



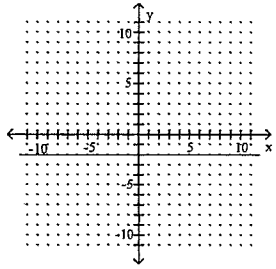
B)



C)



D)



Find the domain and range.

16) $y = x^2 - 8$ 16) _____

A) Domain: $(-\infty, \infty)$, Range: $(-\infty, \infty)$

B) Domain: $[-64,\infty)$, Range: $[-8,\infty)$

C) Domain: $(-\infty, \infty)$, Range: $[-8,\infty)$

D) Domain: $[0, \infty)$, Range: $(-\infty, -8]$

17) $y = 7 - \sqrt{x}$ 17) _____

A) Domain: $(-\infty,7]$, Range: $(-\infty, \infty)$

B) Domain: $[0,\infty)$, Range: $(-\infty,7]$

C) Domain: $(-\infty, \infty)$, Range: $(-\infty,7]$

D) Domain: $(-\infty,0]$, Range: $[7,\infty)$

Determine if the function is even, odd, or neither.

18) $y = 3x^2 + 4$ 18) _____

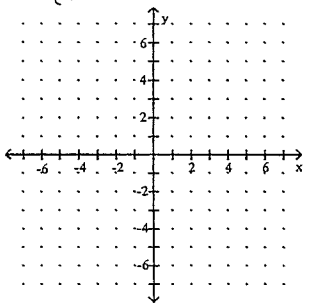
A) Even B) Odd C) Neither

19) $y = 9x^5 - 7x^3$ 19) _____

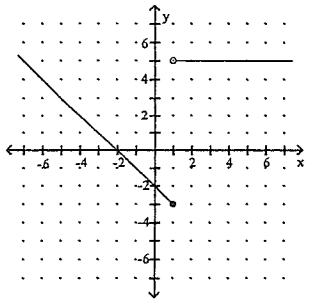
A) Even B) Odd C) Neither

Graph the piecewise-defined function.

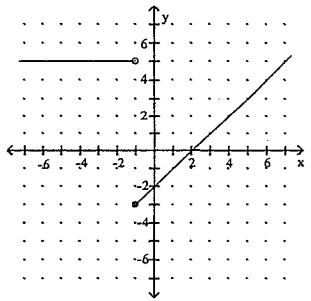
20) $f(x) = \begin{cases} -2 - x, & x < 1 \\ 5, & x \geq 1 \end{cases}$ 20) _____



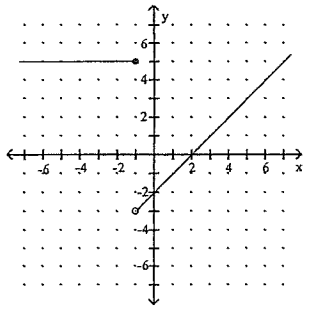
A)



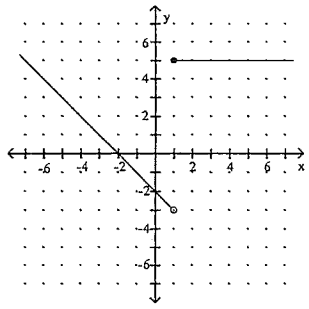
B)



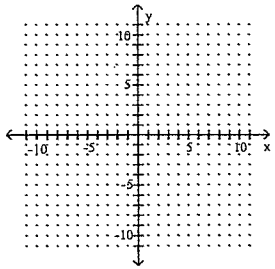
C)



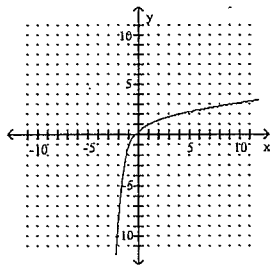
D)



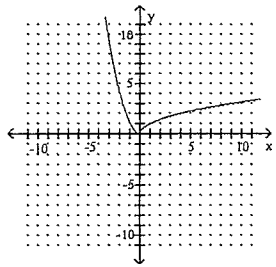
21) $h(x) = \begin{cases} x^3 & \text{if } x < 0 \\ \sqrt{x} & \text{if } x \geq 0 \end{cases}$ 21) _____



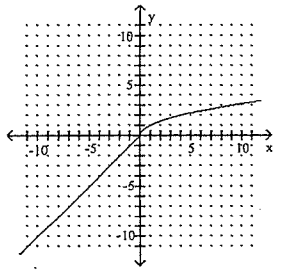
A)



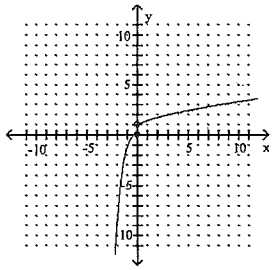
B)



C)

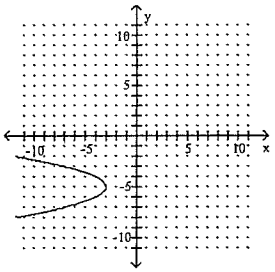


D)



Use the vertical line test to determine if the graph is a graph of a function.

22) _____

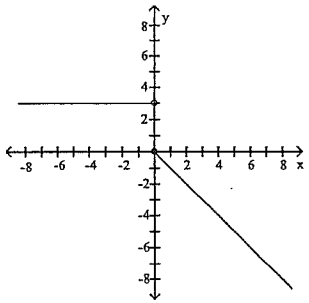


A) No

B) Yes

Find a formula for the function graphed.

23) _____



A) $f(x) = \begin{cases} 3, & x < 0 \\ x, & x \geq 0 \end{cases}$

B) $f(x) = \begin{cases} 3, & x \leq 0 \\ -x, & x > 0 \end{cases}$

C) $f(x) = \begin{cases} 3, & x < 0 \\ -x, & x \geq 0 \end{cases}$

D) $f(x) = \begin{cases} 3, & x < 0 \\ -3x, & x \geq 0 \end{cases}$

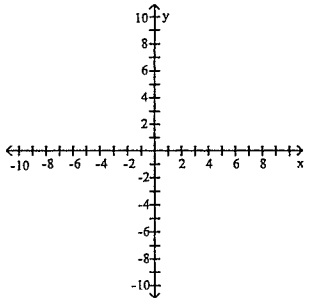
Solve the problem.

24) If $f(x) = 5x + 8$ and $g(x) = 4x - 1$, find $f(g(x))$. _____

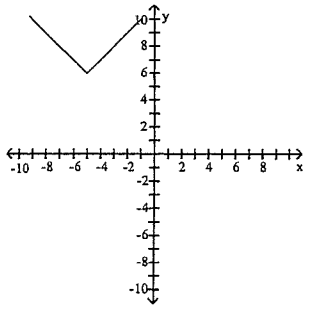
A) $20x + 13$ B) $20x + 31$ C) $20x + 7$ D) $20x + 3$

Graph the function.

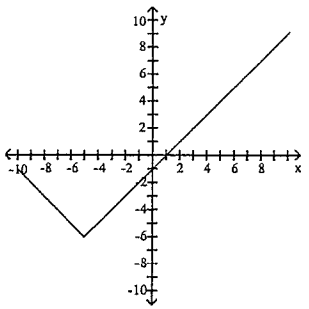
25) $y = |x + 5| - 6$ _____



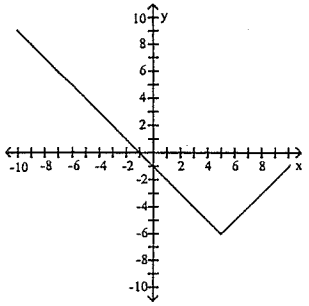
A)



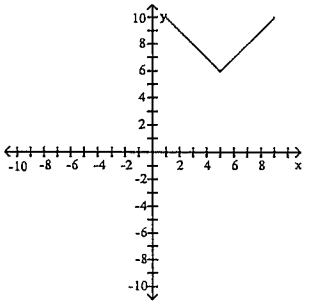
B)



C)



D)



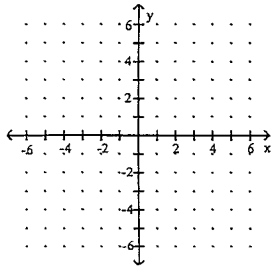
Solve the problem.

26) If $f(x) = 4x^2 + 4x + 6$ and $g(x) = 4x - 3$, find $g(f(x))$. 26) _____

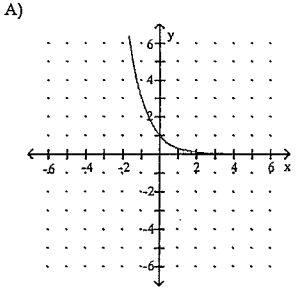
A) $16x^2 + 16x + 21$ B) $4x^2 + 4x + 3$ C) $16x^2 + 16x + 27$ D) $4x^2 + 16x + 21$

Graph the exponential function.

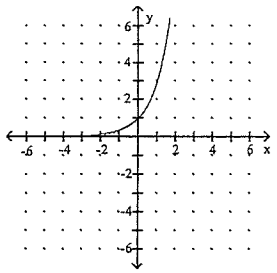
27) $y = 3^x$ 27) _____



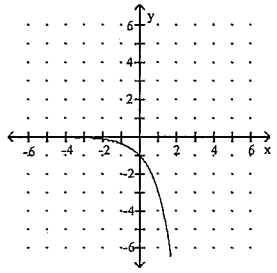
A)



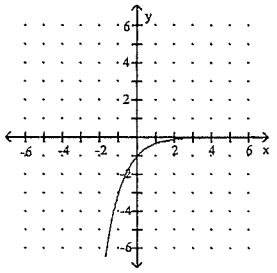
B)



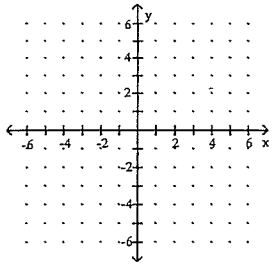
C)



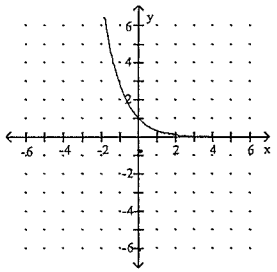
D)



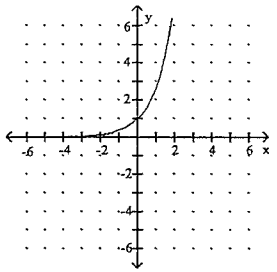
28) $y = e^x$ 28) _____



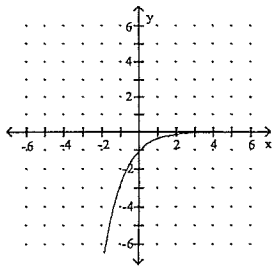
A)



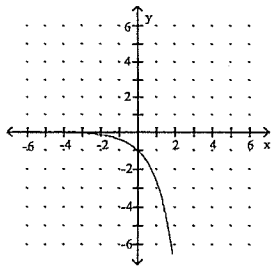
B)



C)



D)



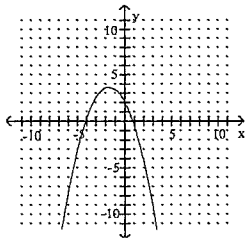
Use your grapher to find the zero of the function. Round your answer to three decimal places.

29) $f(x) = e^x - 7$ 29) _____

A) 3.246 B) 1.845 C) 2.056 D) 1.946

Determine if the function is one-to-one.

30) 30) _____



A) No B) Yes

Find the inverse of the function.

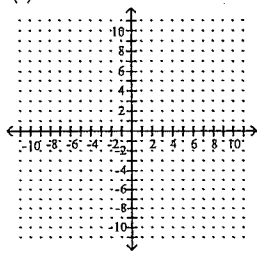
31) $f(x) = 6x - 3$ 31) _____

A) $f^{-1}(x) = \frac{x+3}{6}$ B) $f^{-1}(x) = \frac{x-3}{6}$

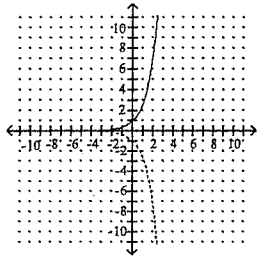
C) $f^{-1}(x) = \frac{x}{6} + 3$ D) Not a one-to-one function

Graph the function f as a solid curve. Then, on the same coordinate system, graph f^{-1} as a dashed curve.

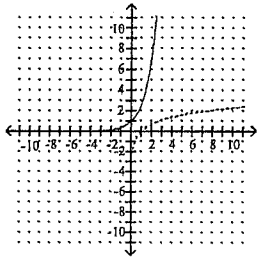
32) $f(x) = e^x$ 32) _____



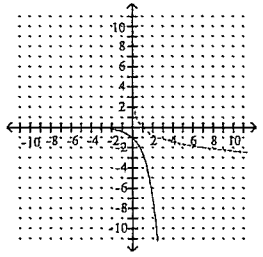
A)



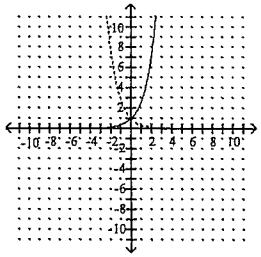
B)



C)



D)



Find the requested function value meeting all of the given conditions.

33) $\sin\theta = \frac{\sqrt{3}}{2}$ and $\tan\theta > 0$; Find $\cos\theta$. 33) _____

A) 1 B) $\frac{\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

Find the exact value of the real number y.

34) $y = \sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$ 34) _____

A) $\frac{3\pi}{4}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{2\pi}{3}$

35) $y = \arccos\left(\frac{1}{2}\right)$ 35) _____

A) $-\frac{\pi}{6}$ B) $\frac{\pi}{6}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{3}$

Name_____

TRIG Values

Fill out the following chart. You are expected to know all Trig Values for the AP Calculus Test!!

ANGLE	Cos x	Sin x	Tan x	Cot x	Sec x	Csc x
0						
∏/6						
∏/4						
∏/3						
∏/2						
2∏/3						
3∏/4						
5∏/6						
∏						
7∏/6						
5∏/4						
4∏/3						
3∏/2						
5∏/3						
7∏/4						
11∏/6						
2∏						