

## SUMMER ASSIGNMENT

**Directions:** Please read all questions carefully.

Form to submit your answers: <https://goo.gl/forms/g2GMh5FDTInD5CH23>

**Follow calculator instructions as given in each section.**

\* A choice of “none” is short for “none of these”. A choice of DNE means “does not exist”.

The **multiple choice** problems must be submitted **online** by following the google doc link above by midnight on Thursday, September 7<sup>th</sup>. This assignment will be put in the gradebook as part of your first marking period grade.

**NO CALCULATOR**

**Lines and functions**

- Determine the slope of the line that passes through the points  $(-1, 6)$  and  $(11, -6)$ .  
a) 1                      b) -1                      c) 0                      d)  $\frac{6}{5}$                       e)  $\frac{-5}{6}$
- Find the equation of the line that passes through the point  $(1, -1)$  and has a slope of -3.  
a)  $y = -3x - 2$                       b)  $y = -3x + 2$                       c)  $y = -3x - 1$   
d)  $y = -3x + 4$                       e) none of these
- Determine which points lie on the vertical line that contains the point  $(5, 1)$ .  
a)  $(5, 0)$                       b)  $(0, 1)$                       c)  $(1, 5)$   
d) all of these                      e) none of these
- What is the slope of the line parallel to the line  $7x - 2y = 12$ ?  
a)  $\frac{7}{2}$                       b)  $\frac{-7}{2}$                       c)  $\frac{2}{7}$                       d) -6                      e) 6
- Find an equation of the line that passes through  $(-1, -3)$  parallel to the line  $2x + y = 19$ .  
a)  $y = -2x - 3$                       b)  $y = -2x - 5$                       c)  $y = 2x - 1$   
d)  $y = -\frac{1}{2}x - \frac{7}{2}$                       e) none of these

6) Find an equation of the line that passes through (8, 17) and is perpendicular to the line  $x + 2y = 2$ .

a)  $y = 2x + 8$

b)  $y - 17 = 2(x - 8)$

c)  $y = \frac{-1}{2}x + 21$

d)  $y = -2x - 17$

e)  $8x + 17y = 2$

7) Given  $A = \{1, 2, 3\}$  and  $B = \{-2, -1, 0, 1\}$ , determine which of the sets of ordered pairs represents a function from A to B.

a)  $\{(1, -2), (2, -2), (3, -1), (2, 0), (2, 1)\}$

b)  $\{(1, -2), (2, -1), (2, 0), (3, 1)\}$

c)  $\{(1, -2), (2, -1), (3, 0), (1, 1)\}$

d) all of these

e) none of these

8) Which of the following **does not** represent  $y$  as a function of  $x$ ?

a)  $3x^2 + 4y = 8$

b)  $3x - 2y = 0$

c)  $3x^3 + y = 0$

d)  $3x + 4y^2 = 8$

e)  $x^2 - y = 16$

9) Given  $f(x) = 6 - 2x^2$ , find  $f(-3)$ .

a) 12

b) 24

c) -12

d) -24

e) none

10) Given  $f(x) = \begin{cases} x^2 + 1, & x < 4 \\ 6x - 7, & x \geq 4 \end{cases}$  find  $f(-2)$ .

a) -19

b) 5

c) 4

d) -5

e) none

11) Given  $f(x) = 6$  and  $g(x) = 2x^2 - 1$ , find  $f(x) - g(x)$ .

a)  $2x^2 + 5$

b)  $2x^2 - 7$

c)  $-2x^2 + 7$

d)  $-2x^2 + 5$

e) none

12) Given  $f(x) = x^2$  and  $g(x) = x + 5$ , find  $g(f(x))$ .

a)  $(x + 5)^2$

b)  $x^2 + 5$

c)  $x^2 + 25$

d)  $x^2 + 5x^2$

e) none

13) Given  $f(x) = x$  and  $g(x) = x^2 - 7$ , find  $f(3) \square g(3)$ .

- a) -13      b) 29      c) 5      d) 6      e) none

14) Given  $f(x) = x^2 - 2x$  and  $g(x) = 2x + 3$ , find  $f(g(x))$ .

- a)  $4x^2 + 8x + 3$       b)  $2x^2 - 4x + 3$       c)  $2x^3 - x^2 - 6x$   
d)  $3x^2 + x$       e) none of these

15) If  $f(x) = \frac{1}{2}x$ , find  $\frac{f(x+h) - f(x)}{h}$ .

- a) 2      b)  $\frac{1}{2}$       c)  $\frac{x + \frac{1}{2}h}{h}$       d) 1      e) none

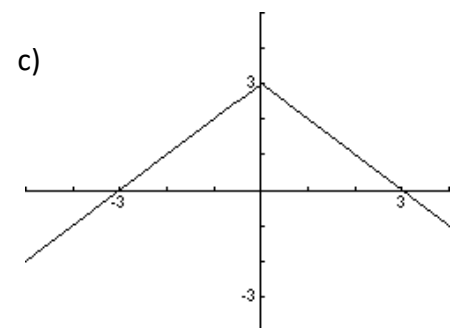
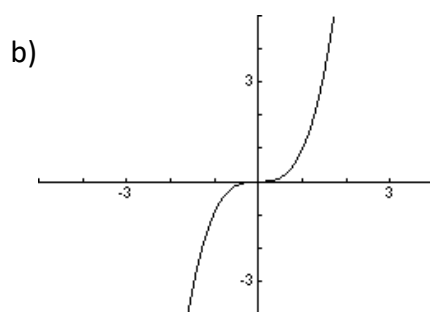
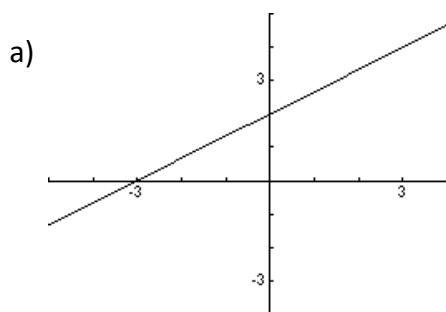
16) Is the function  $f(x) = 2x^3 + 3x^2$

- a) even      b) odd      c) neither

17) If  $f$  is a one-to-one function on its domain, the graph  $f^{-1}(x)$  is a reflection of the graph of  $f(x)$  with respect to:

- a) the x-axis      b) the y-axis      c)  $y = x$       d)  $y = -x$       e) none

18) In which graph does  $y$  not represent a one-to-one function of  $x$ ?



- d) All of these are one-to-one functions of  $x$ .      e) None of these are one-to-one function of  $x$ .

19) Given  $f(x) = 3x^3 - 1$ , find  $f^{-1}(x)$ .

a)  $\frac{1}{3x^3 - 1}$

b)  $3x^{-1} - 1$

c)  $3(x + 1)$

d)  $\sqrt[3]{\frac{x + 1}{3}}$

e) none

**CALCULATOR**

**Lines and functions**

20) Use your calculator to determine the interval(s) on the real axis for which  $f(x) \geq 0$  where

$$f(x) = \sqrt{x - 9}.$$

a)  $(-\infty, \infty)$

b)  $[-9, 9]$

c)  $[-3, 3]$

d)  $[9, \infty)$

e) none

21) Find the relative max/min of  $f(x) = x^3 - x$ .

a) relative maximum at  $(-0.58, -0.38)$

b) relative maximum at  $(-0.58, 0.38)$

relative minimum at  $(0.58, -0.38)$

c) relative maximum at  $(0.58, -0.38)$

d) no relative minimum or relative maximum

relative minimum at  $(-0.58, 0.38)$

e) none of these

22) Find the minimum point on the graph of  $f(x) = x^2 - 4x + 14$ .

a)  $(2, 18)$

b)  $(-2, 18)$

c)  $(-2, 26)$

d)  $(2, 10)$

e) none

**NO CALCULATOR**

**Solving equations**

23) Solve for x.  $\frac{3x}{2} - \frac{x + 1}{4} = 6$

a) 5

b)  $\frac{23}{5}$

c)  $\frac{35}{8}$

d)  $\frac{1}{2}$

e) none

24) Solve for x.  $\frac{1}{x - 3} - \frac{2}{x + 3} = \frac{2x}{x^2 - 9}$

a)  $-\frac{1}{2}$

b) 3

c) -3

d) -3 and 3

e) none

25) Solve for x.  $\frac{7x}{x-2} + \frac{2x}{x+2} = 9$

- a)  $-\frac{18}{5}$       b)  $\frac{2}{3}$       c)  $-\frac{2}{5}$       d)  $\frac{5}{18}$       e) none

26) Solve for x.  $(x+2)^2 = -16x$

- a)  $-8 \pm 2\sqrt{15}$     b)  $-10 \pm 4\sqrt{6}$     c)  $-10 \pm 2\sqrt{26}$     d)  $-8 \pm 4\sqrt{15}$     e) none

27) Solve for x.  $(3x-1)^2 = 25$

- a)  $-\frac{4}{3}, 2$       b)  $-2, 2$       c)  $2$       d)  $-2, \frac{4}{3}$       e) none

28) Solve for x.  $3x^3 - 24x^2 + 21x = 0$

- a)  $7, 1$       b)  $-7, -1$       c)  $0, 1, 7$       d)  $0, -1, -7$       e) none

29) Solve for x.  $(x^2 + 4)^{\frac{2}{3}} = 25$

- a)  $-5.8, 5.8$     b)  $-4.6, 4.6$     c)  $21$       d)  $-11, 11$       e) none

30) Solve for x.  $|2 - 4x| = 12$

- a)  $-\frac{5}{2}, \frac{7}{2}$       b)  $-\frac{5}{2}, -\frac{7}{2}$       c)  $\frac{5}{2}, -\frac{5}{2}$       d)  $-\frac{5}{2}$       e) none

31) Solve by factoring.  $2x^2 + 4x = 9x + 18$

- a)  $-2, \frac{9}{2}$       b)  $2, -\frac{9}{2}$       c)  $\frac{9}{2}$       d)  $-\frac{9}{2}$       e) none

32) Solve by completing the square.  $x^2 - 6x + 1 = 0$

- a)  $3 \pm \sqrt{26}$       b)  $3 \pm \sqrt{10}$       c)  $3 \pm \sqrt{17}$       d)  $3 \pm 2\sqrt{2}$       e) none

33) Solve for x.  $\frac{2x-1}{x} + 1 = \frac{4}{x+1}$

- a) 1      b) -1      c)  $-\frac{1}{3}, 1$       d)  $-1, \frac{1}{3}$       e) none

34) Solve for x.  $3x^2 - 6x + 2 = 0$

- a)  $\frac{3 \pm \sqrt{3}}{3}$       b)  $1 \pm \sqrt{3}$       c)  $\frac{3 \pm \sqrt{15}}{3}$       d)  $\frac{1}{3}, 2$       e) none

35) Solve for x.  $4x^2 + 12x = 135$

- a)  $-\frac{9}{2}, \frac{15}{2}$       b)  $-\frac{5}{2}, \frac{3}{2}$       c)  $-\frac{15}{2}, \frac{9}{2}$       d)  $-\frac{3 \pm \sqrt{6}}{2}$       e) none

36) Solve the inequality algebraically.  $3 - 2x \leq 9$

- a)  $(-\infty, -3]$       b)  $(-\infty, 3]$       c)  $[-3, \infty)$       d)  $[3, \infty)$       e) none

37) Find all the real zeros of the polynomial function  $f(x) = x^6 - x^2$ .

- a) 0      b) 0, 1      c) 1      d) 0, 1, -1      e) none

**CALCULATOR**

### Solving equations

38) Approximate the solution(s) of  $x^4 + 2x^3 + 5x - 1 = 0$  using your graphing calculator.

- a) -2.72, 0.20      b) -1, 0      c) -2.72, -0.11      d) no solution      e) none

39) Use your graphing calculator to approximate the solution(s) of  $\frac{1}{x-3} = 9$ .

- a) 3.000      b) 3.11      c) 2.90      d) no solution      e) 0

40) Approximate the points of intersection of the graphs of  $y = 5x - 14$  and  $y = -3x - 6$ .

- a) (1, -9)      b) (2, -4)      c) (3, -15)      d) (0, 0)      e) none

41) Approximate the solution(s) of  $|3x + 10| = 13$ .

- a) 1      b) -1, 1      c) -7.67, 1      d) 1, 7.67      e) none

42) Evaluate  $y = \frac{300}{1 + e^{-2t}}$  when  $t = 3$ .

- a) 299.2582      b) 213.3704      c) 300.0025      d) 107.4591      e) none

**NO CALCULATOR**

**Factoring and division**

43) Use synthetic division to factor the polynomial  $x^3 - x^2 - 10x - 8$  completely if -2 is a zero.

- a)  $(x - 2)(x - 4)(x + 1)$       b) -2, -4, -1      c)  $(x + 2)(x - 4)(x + 1)$   
d)  $(x + 2)(x + 4)(x - 1)$       e) none of these

44) Which polynomial function has zeros of 0, -1 and 2?

- a)  $f(x) = x(x - 1)(x + 2)$       b)  $f(x) = x(x + 1)(x - 2)$   
c)  $f(x) = (x + 1)(x - 2)$       d)  $f(x) = (x + 1)^2(x - 2)$       e) none

45) Use long division to find the quotient.  $(6x^3 + 7x^2 - 15x + 6) \div (2x - 1)$

a)  $3x^2 + 2x - \frac{17}{2} - \frac{5}{2(2x - 1)}$

b)  $3x^2 + 5x - 5 + \frac{1}{(2x - 1)}$

c)  $3x^2 + 5x + 5 + \frac{11}{(2x - 1)}$

d)  $3x^2 + 4x - 17 + \frac{29/2}{(2x - 1)}$

e) none

**NO CALCULATOR**

**Graphs**

46) Find the domain of the relation shown at the right.

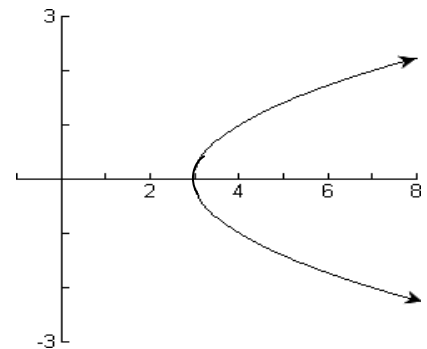
a)  $(-\infty, \infty)$

b)  $(-\infty, 3]$

c)  $(-\infty, 3)$

d)  $[3, \infty)$

e) none of these



47) Find the range of the function shown at the right.

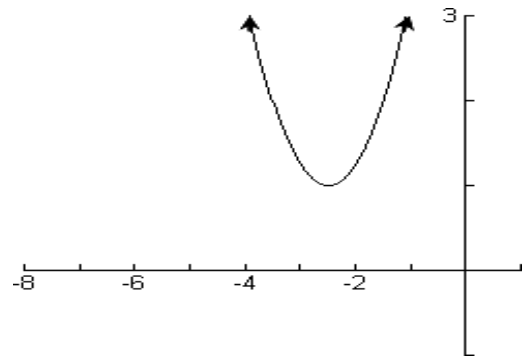
a)  $(-\infty, \infty)$

b)  $(-8, 1)$

c)  $[-3, \infty)$

d)  $[-1, 5]$

e) none of these



48) Find the domain of the function  $f(x) = \sqrt{5 - x}$ .

a)  $(-\infty, 5]$

b)  $(-\infty, 5)$

c)  $[-5, \infty)$

d)  $(-5, \infty)$

e) none

49) Describe the transformation of the graph of  $f(x) = |x|$  which yields the graph of  $g(x) = |x| - 20$ .

a) vertical shift 20 units up

b) vertical shift 20 units down

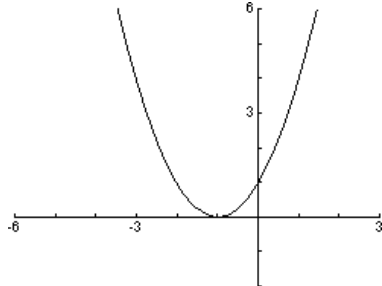
c) horizontal shift 20 units right

d) horizontal shift 20 units left

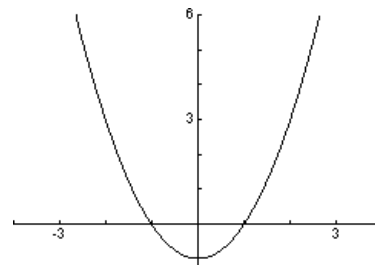


50) Graph  $g(x) = (x - 1)^2$  using a transformation of the graph of  $f(x) = x^2$ .

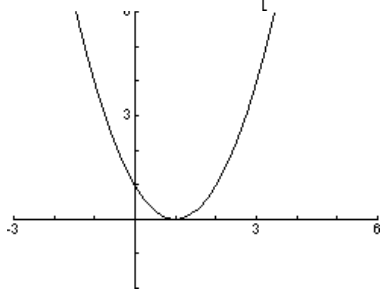
a)



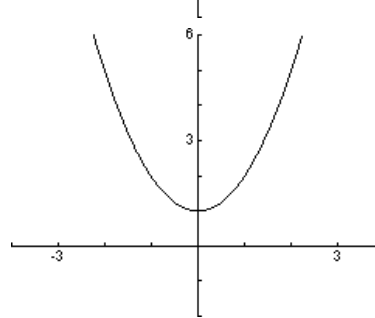
b)



c)



d)



51) Which sequence of transformations will yield the graph of  $g(x) = (x + 1)^2 + 10$  from the graph of  $f(x) = x^2$ ?

a) horizontal shift 10 units right  
vertical shift 1 unit up

b) horizontal shift 1 unit left  
vertical shift 10 units up

c) horizontal shift 1 unit right  
vertical shift 10 units up

d) horizontal shift 10 units left  
vertical shift 1 unit up

52) Find the x-intercept(s) of  $3x^2 + 2y^2 + 4xy - 12 = 0$

a)  $(\pm\sqrt{6}, 0)$

b)  $(\pm 2, 0)$

c)  $(4, 0)$

d)  $(6, 0)$

e) none

53) Find the intercepts of the graph of  $3x + 7y = 21$ .

a) x-int:  $(0, 7)$   
y-int:  $(3, 0)$

b) x-int:  $(0, 3)$   
y-int:  $(7, 0)$

c) x-int:  $(3, 0)$   
y-int:  $(0, 7)$

d) x-int:  $(7, 0)$   
y-int:  $(0, 3)$

e) none

54) Find the x and y-intercepts:  $y = x^2 - 5x + 4$

a)  $(0, -4), (0, 1), (4, 0)$

b)  $(0, 4), (4, 0), (1, 0)$

c)  $(0, -4), (-4, 0), (-1, 0)$

d)  $(0, 4), (-4, 0), (-1, 0)$

e) none of these

55) Determine the left and right behaviors of the graph of  $f(x) = -x^5 + 2x^2 - 1$ .

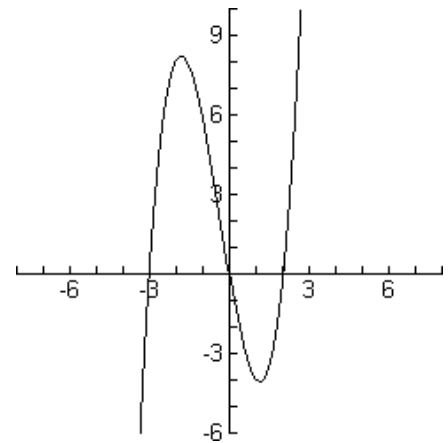
- a) up to the left, down to the right
- b) down to the left, up to the right
- c) up to the left, up to the right
- d) down to the left, down to the right
- e) none of these

56) Determine the left and right behaviors of the graph of  $f(x) = -x^4 + 3x^3 + 5x^2$ .

- a) up to the left, down to the right
- b) down to the left, up to the right
- c) up to the left, up to the right
- d) down to the left, down to the right
- e) none of these

57) Which function is graphed?

- a)  $f(x) = x^3 + x^2 - 6$
- b)  $f(x) = -x^3 - x^2 + 6x$
- c)  $f(x) = x^3 + x^2 - 6x$
- d)  $f(x) = x^4 + x^2 - 6x$
- e) none of these



58) Find the domain of the function  $f(x) = \frac{1}{x^2 - 3x + 2}$ .

- a)  $(-\infty, -2), (-2, 1), (1, \infty)$
- b)  $(-\infty, 1), (1, 2), (2, \infty)$
- c)  $(-\infty, \infty)$
- d)  $(-\infty, \frac{1}{2}), (\frac{1}{2}, \infty)$
- e) none of these

59) Find the domain of  $f(x) = \frac{x + 2}{x^2 - 3x + 2}$ .

- a) all real numbers except -2, 1, and 2
- b) all real numbers except -2
- c) all real numbers except 1 and 2
- d) all real numbers
- e) none

60) Find the domain of  $f(x) = \frac{3x - 1}{x^2 + 9}$ .

- a) all real numbers  
 b) all real numbers except  $\pm 3$   
 c) all real numbers except  $\frac{1}{3}$   
 d) all real numbers except  $\frac{1}{3}, \pm 3$  e) none

61) Find the vertical asymptote(s) of the graph of  $f(x) = \frac{x + 3}{(x - 2)(x + 5)}$ .

- a)  $y = 2, y = -5, y = -3$   
 b)  $x = 2, x = -5, x = -3, x = 1$   
 c)  $x = 1$   
 d)  $x = 2, x = -5$  e) none

62) Find the horizontal asymptote(s) of the graph of  $f(x) = \frac{3x - 1}{x + 2}$ .

- a)  $y = 0$  b)  $x = -2$  c)  $x = \frac{1}{3}$  d)  $y = 3$  e) none

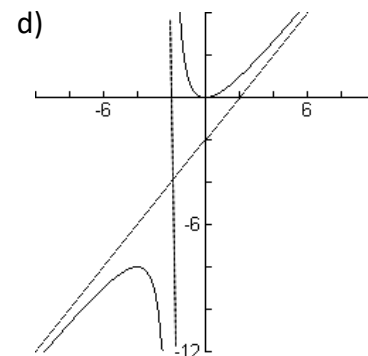
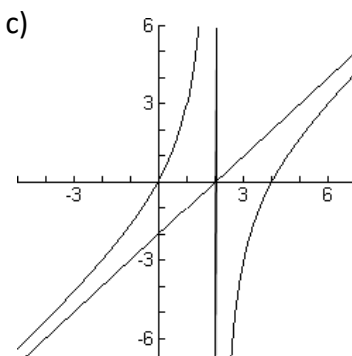
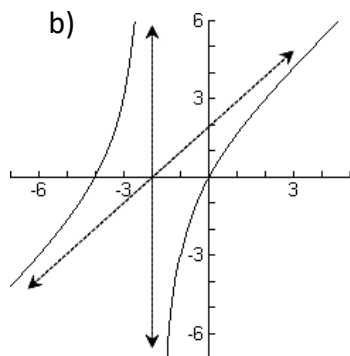
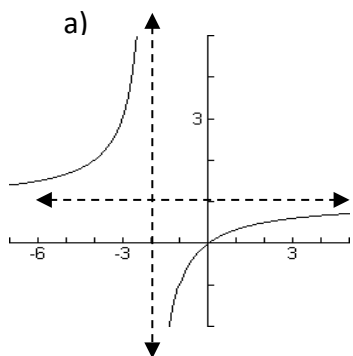
63) Find the horizontal asymptote(s) of the graph of  $f(x) = \frac{3x^2 + 2x - 16}{x^2 - 7}$ .

- a)  $x = \pm\sqrt{7}$  b)  $y = 3$  c)  $y = \pm 7$  d)  $y = 0$  e) none

64) Find all intercepts of the graph of  $f(x) = \frac{x - 14}{2x + 7}$ .

- a)  $(0, -2), (14, 0)$  b)  $(-14, 0), (\frac{1}{2}, 0)$  c)  $(14, 0), (0, \frac{1}{2})$   
 d)  $(14, 0), (0, -\frac{7}{2})$  e) none

65) Match the rational function with the correct graph.  $f(x) = \frac{x^2}{x + 2}$



66) Match the graph with the correct function.

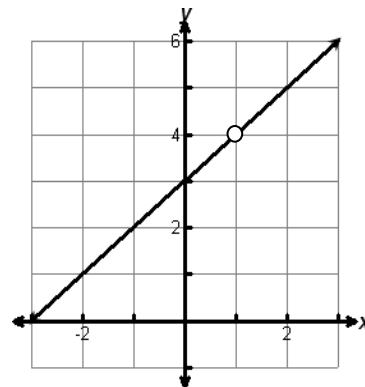
a)  $f(x) = \frac{x+3}{x-1}$

b)  $f(x) = x + 3$

c)  $f(x) = \frac{x-1}{x^2+2x-3}$

d)  $f(x) = \frac{x^2+2x-3}{x-1}$

e) None of these



67) What is the domain of  $f(x) = 3 - e^x$ ?

a)  $(3, \infty)$

b)  $[0, \infty)$

c)  $(-\infty, \infty)$

d)  $(-\infty, 3)$

e) none

**NO CALCULATOR**

### Trigonometry

68) Give the exact value of  $\cos\left(-\frac{3\pi}{4}\right)$ .

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

b)  $-\frac{1}{2}$

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

d)  $\frac{\sqrt{2}}{2}$

e) none

69) Find all solutions to  $2\cos x - \sqrt{3} = 0$  in the interval  $[0, 2\pi]$ .

a)  $\frac{\pi}{6}, \frac{11\pi}{6}$

b)  $\frac{5\pi}{6}, \frac{7\pi}{6}$

c)  $\frac{\pi}{3}, \frac{5\pi}{3}$

d)  $\frac{2\pi}{3}, \frac{4\pi}{3}$

e) none

70) Give the exact value of  $\csc\frac{3\pi}{2}$ .

a) 2

b) undefined

c) -1

d) 1

e) none of these

71) Find all solutions to  $\sec^2 x = \sec x + 2$  in the interval  $[0, 2\pi]$ .

a)  $\frac{\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{3\pi}{2}$

b)  $\frac{\pi}{3}, \pi, \frac{5\pi}{3}$

c)  $\frac{2\pi}{3}, \frac{4\pi}{3}$

d)  $\frac{\pi}{6}, \pi, \frac{11\pi}{6}$

e) none

72) Find the exact value of  $\tan \frac{5\pi}{6}$ .

- a)  $\frac{\sqrt{3}}{2}$       b)  $\sqrt{3}$       c) -1      d)  $-\frac{\sqrt{3}}{3}$       e) none

73) Evaluate  $\sec \frac{\pi}{3}$ .

- a)  $\frac{\sqrt{2}}{2}$       b)  $\frac{\sqrt{3}}{2}$       c)  $\frac{\sqrt{3}}{3}$       d) 2      e) none

74) Find all solutions of  $2\sin x \cos x + \cos x = 0$  in the interval  $[0, 2\pi)$ .

- a)  $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$       b)  $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$       c)  $\frac{5\pi}{6}, \frac{11\pi}{6}$   
d)  $0, \pi$       e) none of these

**CALCULATOR**

### Trigonometry

75) Given  $\tan \theta = 1.2617$ , find  $\theta$ .

- a) 0.0220      b) 0.9006      c) 1.0145      d) 0.3193      e) none

76) Find two values of  $\theta$  ( $0 \leq \theta \leq 2\pi$ ) that satisfy  $\sec \theta = 5.1258$ .

- a) 1.767 and 4.516      b) 1.374 and 4.909      c) 1.134 and 1.767  
d) 1.767 and 4.909      e) none of these

77) Evaluate  $\arccos(-0.4777)$ .

- a) -1.0049      b) 1.0728      c) 2.0934      d) 2.0688      e) none

NO CALCULATOR

**Logarithms and natural logarithms**

78) Solve for x.  $27^x = 81$

- a)  $\frac{3}{4}$       b)  $-\frac{1}{3}$       c)  $\frac{4}{3}$       d)  $\frac{2}{3}$       e) none

79) Evaluate.  $\ln e^{1-x}$

- a)  $e^{1-x}$       b)  $e$       c)  $1-x$       d)  $\ln(1-x)$       e) none

80) Simplify.  $\ln \sqrt[5]{e^3 x}$

- a)  $\frac{3e}{5} + \frac{1}{5} \ln x$       b)  $\frac{3e}{5} + \ln \frac{x}{5}$       c)  $\frac{3}{5} + \ln \frac{x}{5}$       d)  $\frac{3}{5} + \frac{1}{5} \ln x$       e) none

81) Simplify.  $\ln \sqrt{e^3}$

- a)  $\ln \frac{3}{2}$       b)  $\ln \frac{2}{3}$       c)  $\frac{3}{2}$       d)  $\frac{2}{3}$       e) none

82) Solve for x.  $\ln e^{2x+1} = 9$

- a)  $\frac{-1 + \ln 9}{2}$       b)  $\frac{9}{2 \ln e} - \frac{1}{2}$       c) 23      d) 4      e) none

83) Simplify.  $7 + \ln e^{5x}$

- a)  $5x + \ln 7$       b)  $7 + 5x$       c)  $\frac{\ln 7}{5x}$       d)  $35x$       e) none

84) Solve for  $x$ .  $2^{1-x} = 3^x$

- a)  $\frac{\ln 2}{\ln 6}$       b)  $\ln \frac{1}{3}$       c)  $\ln \frac{2}{3}$       d)  $\ln 3 + \ln 2$       e) none

85) Solve for  $x$ .  $\ln(7 - x) + \ln(3x + 5) = \ln(24x)$

- a)  $\frac{6}{11}$       b)  $\frac{7}{3}$       c)  $\frac{7}{3}, -5$       d)  $\frac{6}{11}, 5$       e) none

86) Find the domain of the function  $f(x) = \ln(x-1)$ .

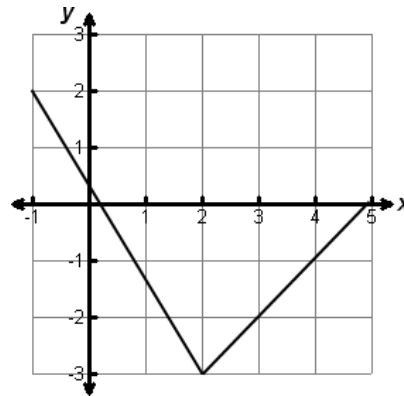
- a)  $(-\infty, \infty)$       b)  $(0, \infty)$       c)  $(1, \infty)$       d)  $(-\infty, 1)$       e) none

**NO CALCULATOR**

**Limits**

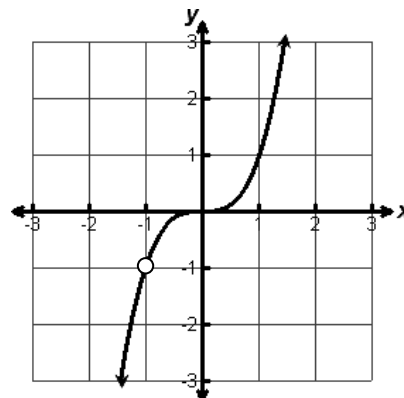
87) Use the graph to estimate  $\lim_{x \rightarrow 2} f(x)$ .

- a) DNE      b) 0  
c) -3      d) 2  
e) none



88) Use the graph to find  $\lim_{x \rightarrow -1} f(x)$ , if it exists.

- a) 1      b) -2  
c) DNE      d) -1  
e) -3



89) Find  $\lim_{x \rightarrow -3} (-2x^2 + 1)$

- a) 37      b) 19      c) -17      d)  $\pm\sqrt{2}$       e) none

90) Find  $\lim_{x \rightarrow -1} \frac{x^2 - 5x - 6}{x + 1}$ .

- a) 0      b) -7      c)  $-\infty$       d)  $\infty$       e) none

91) Find  $\lim_{x \rightarrow -2} \frac{x + 2}{x^3 + 8}$ .

- a)  $\frac{1}{20}$       b) 0      c)  $-\frac{1}{4}$       d)  $\frac{1}{12}$       e) DNE

92) Find the limit.  $\lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - 2(x + \Delta x) - (x^2 - 2x)}{\Delta x}$

- a)  $-4x$       b) -2      c)  $2x - 2$       d) DNE      e) none