

SUMMER ASSIGNMENT

Directions: Please read all questions carefully.

Form to submit your answers:

<https://forms.office.com/Pages/ResponsePage.aspx?id=13g376SzM0md6jJbB-EBVJLnob-sEhBrdqaMnped3NUNdVZV0RCNzBGR0NORINKR1ozUVRMRUVS0y4u>

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 link above by midnight on Wednesday, September 4th. 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 $f(3)g(3)$.

- 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

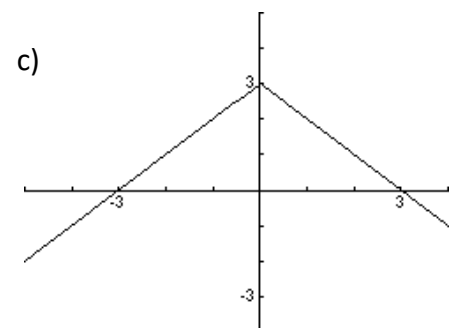
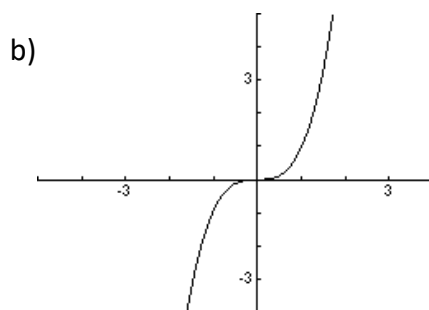
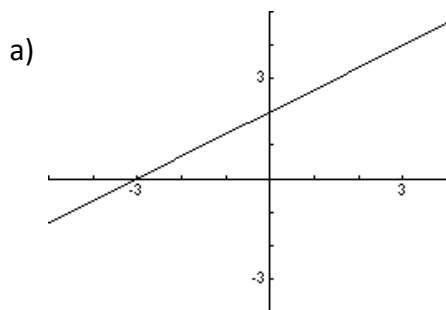
16) Is the function $f(x) = 2x^3 + 3x^2$

- 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.

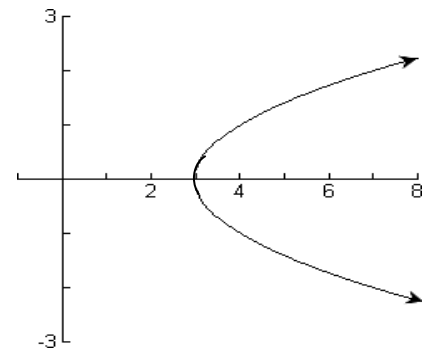
a) $(-\infty, \infty)$

b) $(-\infty, 3]$

c) $(-\infty, 3)$

d) $[3, \infty)$

e) none of these



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

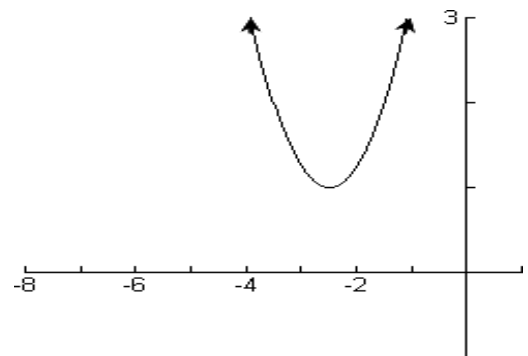
a) $(-\infty, \infty)$

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

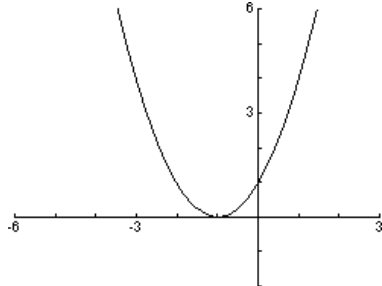
b) vertical shift 20 units down

c) horizontal shift 20 units right

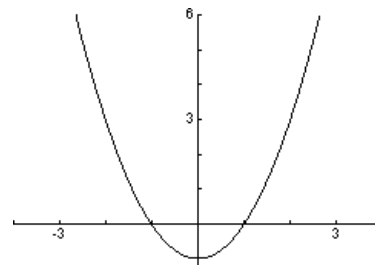
d) horizontal shift 20 units left

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

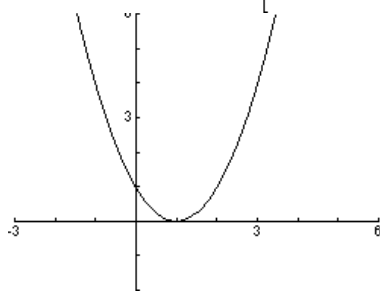
a)



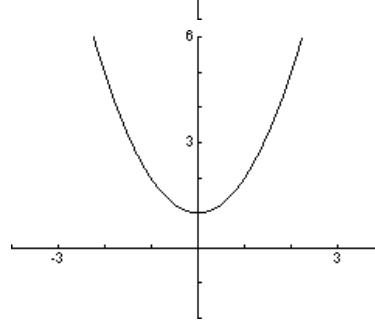
b)



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 $f(x) = -x^5 + 2x^2 - 1$.

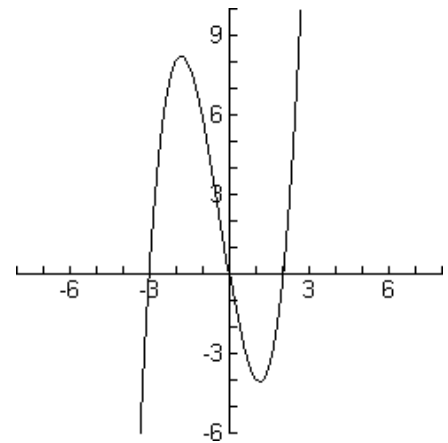
- a) up to the left, down to the right
- b) down to the left, up to the right
- c) up to the left, up to the right
- d) down to the left, down to the right
- e) none of these

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 ± 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) $(0, -2), (14, 0)$

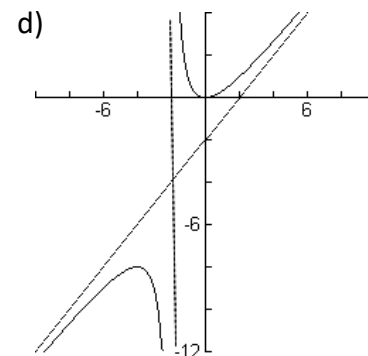
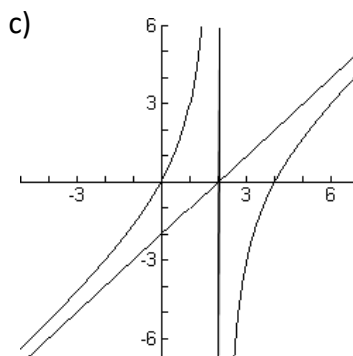
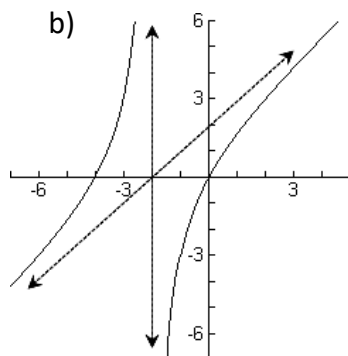
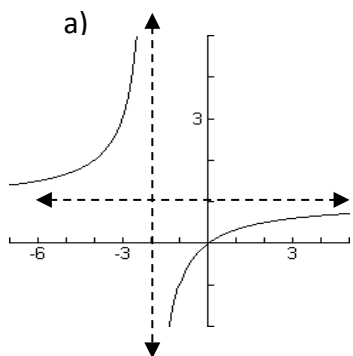
b) $(-14, 0), (\frac{1}{2}, 0)$

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.

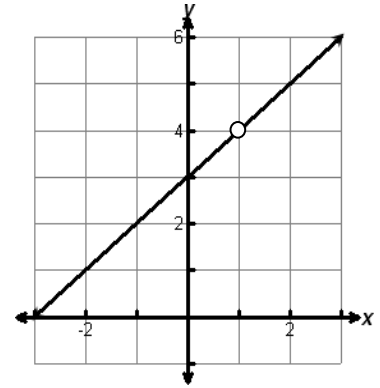
a) $f(x) = \frac{x+3}{x-1}$

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 θ .

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

76) Find two values of θ ($0 \leq \theta \leq 2\pi$) 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 $f(x) = \ln(x-1)$.

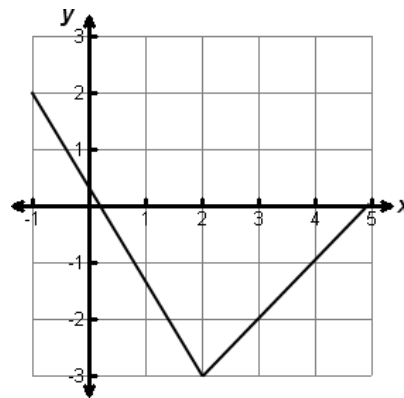
- a) $(-\infty, \infty)$ b) $(0, \infty)$ c) $(1, \infty)$ d) $(-\infty, 1)$ e) none

NO CALCULATOR

Limits

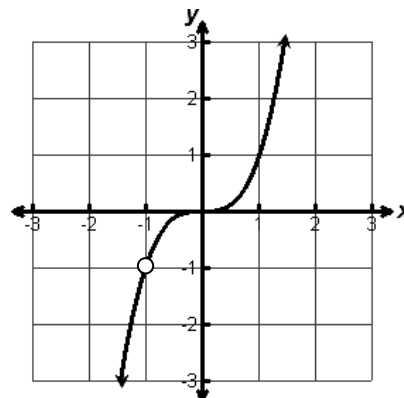
87) Use the graph to estimate $\lim_{x \rightarrow 2} f(x)$.

- 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) ∞ 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