

Math 114 Summer Math Assignment 2026

Directions: This prep work should be completed, to the best of your ability, by the **first day of school of the first semester and turned in on July 30 , to your teacher or Ms.Baker.**

Do all problems in this packet. Do not rush through the packet, give yourself time to process and remember the skills. You will not turn in your Summer Math at registration, but you will need to bring it to class on the first day of school. Please note that all the material in the prep work was covered in previous math classes; there are no excuses. This prep work will be reviewed during the first week of class, followed by a test. Below are some websites that contain videos or notes on skills that you may need to review.

1. [khanacademy.org](https://www.khanacademy.org)
2. [youtube.com](https://www.youtube.com)
3. [coolmath.com](https://www.coolmath.com)
4. [purplemath.com](https://www.purplemath.com)

A/ Refer to your Algebra2/ Pre-Calculus notebooks or the sheets/links provided for assistance.

B/ Show your work (step-by-step solutions). Circle your final answers.

C/ Write neatly and in pencil on your own paper. Number all work as it is numbered.

D/ Do not wait until the last minute to complete this assignment.

E/ Do your own work and complete all problems.

F/ Bring your Summer Math assignment with you on the first day of school.

A test on this material will be given during the first week of school. This test will be the first test grade of the course in the first nine weeks .

MAT 111 Summer Math Assignment For 2026-2027

Due on the first day of school 7/30/2026 for students in either semester.

Follow the instructions/method asked in the question. Show all work on paper.

Name:

Semester:

Is the following correspondence a function?

1) Domain: All students attending LC College

Correspondence: Each student's Social Security Number

Range: A set of Social Security Numbers

A) Yes

B) No

1) _____

2) Domain: All students attending the University of Ohio

Correspondence: Each student's teachers

Range: A set of teachers

A) Yes

B) No

2) _____

Tell whether or not the relation is a function.

3) $\{(-5,-9), (-2,3), (2,-5), (2,9)\}$

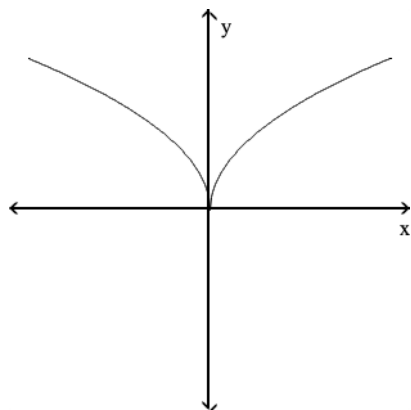
A) Yes

B) No

3) _____

Determine whether the graph is the graph of a function.

4)

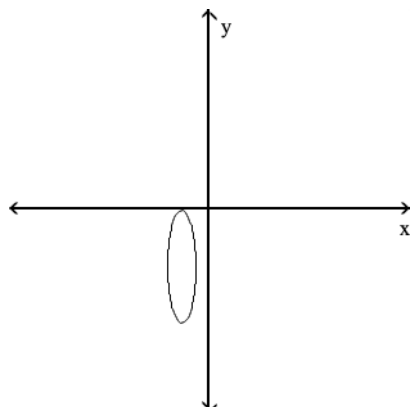


A) Yes

B) No

4) _____

5)



A) Yes

B) No

5) _____

Evaluate as requested.

6) Given that $g(x) = \frac{x}{\sqrt{9-x^2}}$, find $g(-3)$.

6) _____

A) 0

B) 3

C) 1

D) does not exist

7) Given that $h(x) = 4x - \sqrt{x^2 - 2}$, find $h(-x)$.

7) _____

A) $-4x - \sqrt{2 - x^2}$

B) $-4x - \sqrt{x^2 - 2}$

C) $4x - \sqrt{x^2 - 2}$

D) $-4x + \sqrt{x^2 - 2}$

Find the requested function value.

8) $f(x) = \frac{x-1}{3}$, $g(x) = 5x + 9$

8) _____

Find $(g \circ f)(19)$.

A) 624

B) 39

C) 84

D) $\frac{103}{3}$

9) $f(x) = \frac{x-8}{6}$, $g(x) = 4x + 1$

9) _____

Find $(g \circ f)(-10)$.

A) -11

B) $-\frac{47}{6}$

C) -15

D) 117

For the pair of functions, find the indicated composition.

10) $f(x) = -3x + 9$, $g(x) = 2x + 3$

10) _____

Find $(g \circ f)(x)$.

A) $-6x - 15$

B) $-6x + 18$

C) $6x + 21$

D) $-6x + 21$

11) $f(x) = 4x^2 + 5x + 8$, $g(x) = 5x - 7$

11) _____

Find $(g \circ f)(x)$.

A) $4x^2 + 25x + 33$

B) $20x^2 + 25x + 33$

C) $20x^2 + 25x + 47$

D) $4x^2 + 5x + 1$

12) $f(x) = \frac{5}{x}$, $g(x) = 2x^3$

12) _____

Find $(g \circ f)(x)$.

A) $\frac{2x^3}{5}$

B) $\frac{2x^3}{125}$

C) $\frac{250}{x^3}$

D) $\frac{5}{2x^3}$

13) $f(x) = \frac{6}{x-3}$, $g(x) = \frac{7}{6x}$

13) _____

Find $(f \circ g)(x)$.

A) $\frac{36x}{7+18x}$

B) $\frac{36x}{7-18x}$

C) $\frac{6x}{7-18x}$

D) $\frac{7x-21}{36x}$

- 14) $f(x) = \sqrt{x+2}$, $g(x) = 8x - 6$ 14) _____
 Find $(f \circ g)(x)$.
 A) $2\sqrt{2x+1}$ B) $8\sqrt{x+2} - 6$ C) $2\sqrt{2x-1}$ D) $8\sqrt{x-4}$

State the domain of the rational function.

- 15) $f(x) = \frac{x-2}{x^2+4x}$ 15) _____
 A) $(-\infty, -4) \cup (-4, \infty)$ B) $(-\infty, 2) \cup (2, \infty)$
 C) $(-\infty, -4) \cup (-4, 0) \cup (0, \infty)$ D) $(-\infty, 4) \cup (4, \infty)$
- 16) $f(x) = \frac{x^2+2x-24}{x^2-3x-28}$ 16) _____
 A) $(-\infty, \infty)$ B) $(-\infty, -7) \cup (-7, 4) \cup (4, \infty)$
 C) $(-\infty, -4) \cup (-4, 7) \cup (7, \infty)$ D) $(-\infty, 7) \cup (7, \infty)$
- 17) $f(x) = \frac{x-2}{x^2-1}$ 17) _____
 A) $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$ B) $(-\infty, \infty)$
 C) $(-\infty, 2) \cup (2, \infty)$ D) $(-\infty, -1) \cup (-1, \infty)$
- 18) $f(x) = \frac{x-9}{x^2+6}$ 18) _____
 A) $(-\infty, \infty)$ B) $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$
 C) $(-\infty, -6) \cup (-6, \infty)$ D) $(-\infty, 6) \cup (6, \infty)$

For the pair of functions, find the indicated domain.

- 19) $f(x) = \frac{7}{x+9}$, $g(x) = x+5$ 19) _____
 Find the domain of $g \circ f$.
 A) $(-\infty, -9) \cup (-9, \infty)$ B) $(-\infty, \infty)$
 C) $(-\infty, -9] \cup [-9, \infty)$ D) $(-\infty, -14) \cup (-14, \infty)$
- 20) $f(x) = 2x - 5$, $g(x) = \sqrt{x+8}$ 20) _____
 Find the domain of $f \circ g$.
 A) $[8, \infty)$ B) $[-8, \infty)$ C) $(-8, 8)$ D) $[0, \infty)$
- 21) $f(x) = 2x - 5$, $g(x) = \sqrt{x+9}$ 21) _____
 Find the domain of $g \circ f$.
 A) $[9, \infty)$ B) $[-2, \infty)$ C) $[-\infty, -2)$ D) $(-9, 9)$
- 22) $f(x) = \sqrt{x}$, $g(x) = 4x + 4$ 22) _____
 Find the domain of $f \circ g$.
 A) $(-\infty, \infty)$ B) $[-1, \infty)$
 C) $[0, \infty)$ D) $(-\infty, -1] \cup [0, \infty)$

23) $f(x) = x^2 - 16$, $g(x) = 2x + 3$

Find the domain of $g \circ f$.

A) $(-\infty, \infty)$

B) $\left[-\frac{3}{2}, \infty\right)$

C) $\left(-\infty, -\frac{3}{2}\right) \cup \left(-\frac{3}{2}, \infty\right)$

D) $(-4, 4)$

23) _____

Find the slope and the y-intercept of the line with the given equation.

24) $5x - 2y + 7 = 0$

A) $-\frac{5}{2}; \left(0, \frac{7}{2}\right)$

B) $\frac{5}{2}; \left(0, -\frac{7}{2}\right)$

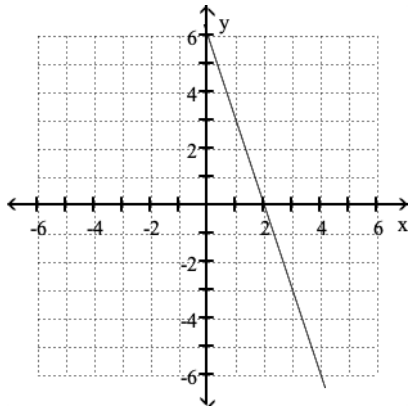
C) $-\frac{5}{2}; \left(0, -\frac{7}{2}\right)$

D) $\frac{5}{2}; \left(0, \frac{7}{2}\right)$

24) _____

Write an equation in slope-intercept form for the line shown.

25)



A) $y = -3x + 6$

B) $y = 3x - 6$

C) $y = -3x - 6$

D) $y = 3x + 6$

25) _____

Write a slope-intercept equation for a line with the given characteristics.

26) Passes through $(4, -9)$ and $(6, -6)$

A) $y = \frac{3}{2}x - 15$

B) $y = -\frac{13}{12}x - \frac{25}{2}$

C) $y = -\frac{3}{2}x - 15$

D) $y = \frac{13}{12}x - \frac{25}{2}$

26) _____

Determine the equation of the line described. Put answer in the slope-intercept form, if possible.

27) Through $(4, 2)$, perpendicular to $3x + 8y = 28$

A) $y = \frac{8}{3}x - \frac{26}{3}$

B) $y = -\frac{8}{3}x + \frac{26}{3}$

C) $y = \frac{3}{8}x + 26$

D) $y = \frac{8}{3}x$

27) _____

28) Through (5, -2), parallel to $9x + 7y = 52$

28) _____

A) $y = -\frac{7}{9}x - \frac{2}{9}$

B) $y = -\frac{5}{7}x + \frac{52}{7}$

C) $y = -\frac{9}{7}x + \frac{31}{7}$

D) $y = \frac{9}{7}x - \frac{31}{7}$

Find the correct end behavior diagram for the given polynomial function.

29) $f(x) = -x^5 - 3x^3 - 9x + 2$

29) _____

A)

B)

C)

D)

For the function find the maximum number of real zeros that the function can have, the maximum number of x-intercepts that the function can have, and the maximum number of turning points that the graph of the function can have.

30) $f(x) = 12x^4 - 11 + 0.15x^2 - 5x$

30) _____

A) 3; 3; 3

B) 2; 2; 1

C) 3; 3; 2

D) 4; 4; 3

Find the zeros of the polynomial function and state the multiplicity of each.

31) $f(x) = x^3 + 5x^2 - x - 5$

31) _____

A) -1, multiplicity 1; 1, multiplicity 1; 5, multiplicity 1

B) -5, multiplicity 1; -1, multiplicity 2

C) -5, multiplicity 1; -1, multiplicity 1; 1, multiplicity 1

D) -5, multiplicity 2; 1, multiplicity 1

32) $f(x) = 3x^3 + x^2 - 27x - 9$

32) _____

A) -3, multiplicity 2; $-\frac{1}{3}$, multiplicity 1

B) -3, multiplicity 1; 3, multiplicity 1; $\frac{1}{3}$, multiplicity 1

C) -3, multiplicity 1; 3, multiplicity 1; $-\frac{1}{3}$, multiplicity 1

D) 3, multiplicity 2; $\frac{1}{3}$, multiplicity 1

Use long division to determine whether the binomial is a factor of $f(x)$.

33) $f(x) = 4x^3 - 30x^2 + 18x + 108$; $x + 3$

33) _____

A) Yes

B) No

Use synthetic division to find the function value.

34) $f(x) = x^5 - 10x^4 + 18x^3 - 5x - 200$; find $f(-8)$.

34) _____

A) -83,106

B) -83,102

C) -82,704

D) -83,104

Using synthetic division, determine whether the numbers are zeros of the polynomial.

35) 1, $-\frac{1}{2}$; $f(x) = x^3 - 3x^2 - \frac{1}{4}x + \frac{3}{4}$

35) _____

A) Yes; yes

B) No; no

C) No; yes

D) Yes; no

Use synthetic division to find the quotient and the remainder.

36) $(x^3 - 4) \div (x - 1)$

A) $Q(x) = x^2 - x - 1; R(x) = 0$

C) $Q(x) = x^2 + x + 1; R(x) = -3$

B) $Q(x) = x^2 + x + 1; R(x) = 4$

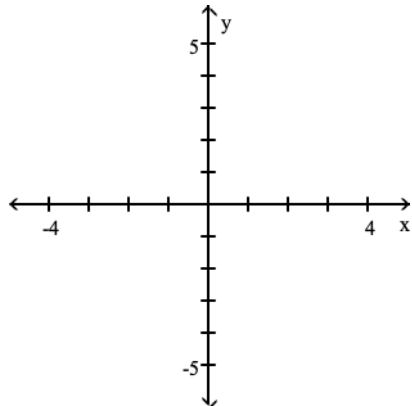
D) $Q(x) = x^3 - x^2 - x - 1; R(x) = 0$

36) _____

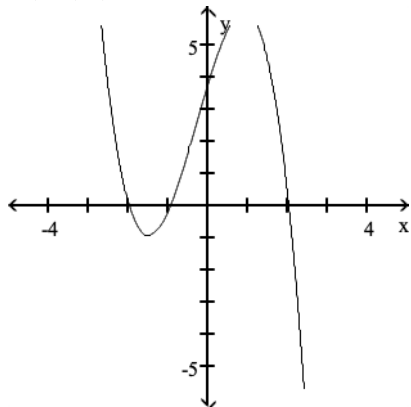
Graph the polynomial function. Use synthetic division and the remainder theorem to find the zeros.

37) $f(x) = -x^3 - 3x^2 + 4$

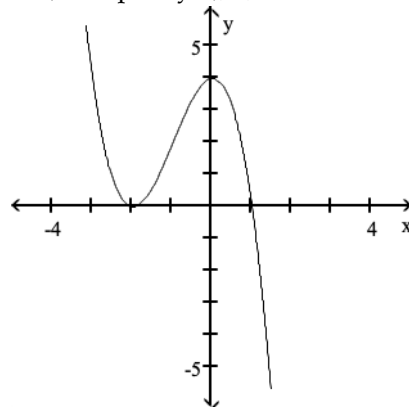
37) _____



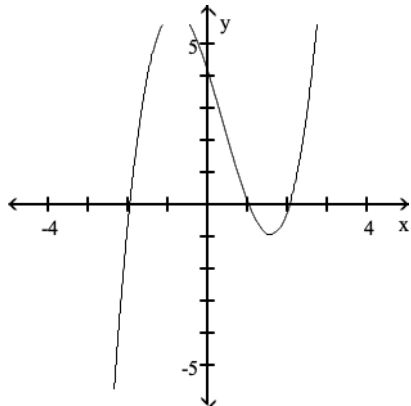
A) $-2, -1, 2;$



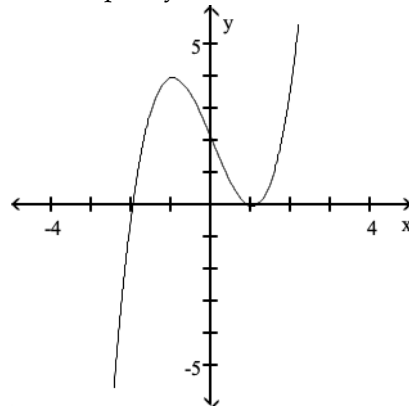
B) -2 (multiplicity 2), $1;$



C) $-2, 1, 2;$

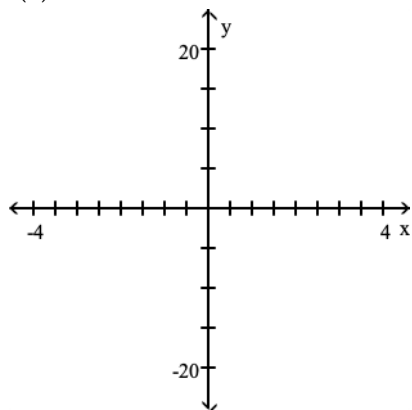


D) 1 (multiplicity 2), $-2;$

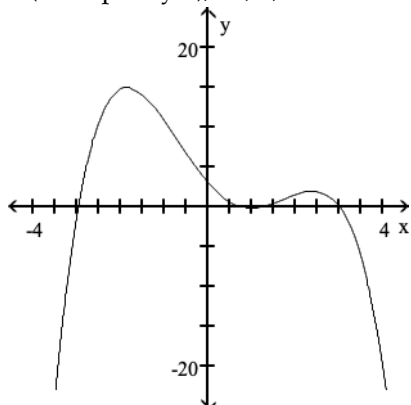


38) $f(x) = x^4 + 4x^3 - 2x^2 - 12x + 9$

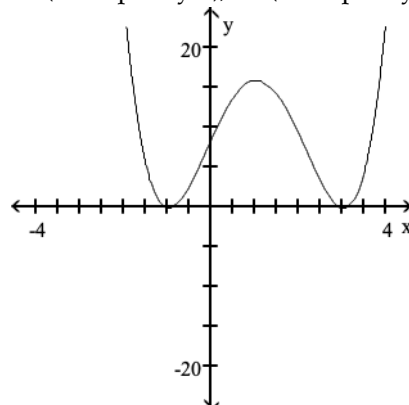
38) _____



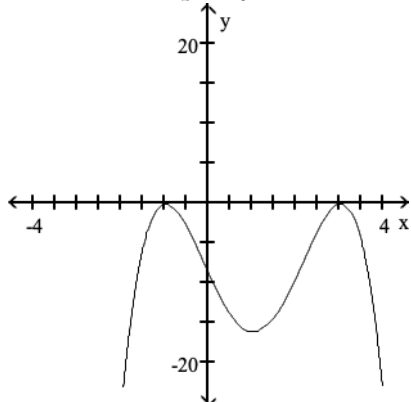
A) 1 (multiplicity 2), -3, 3;



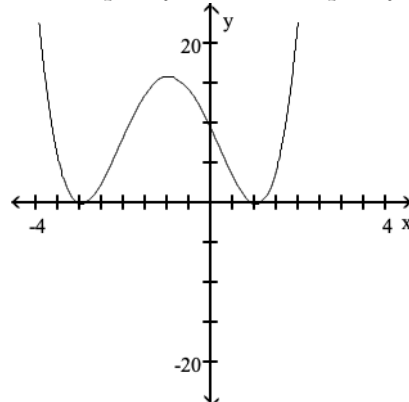
B) -1 (multiplicity 2), -3 (multiplicity 2);



C) -1, 1, -3 (multiplicity 2);



D) 1 (multiplicity 2), -3 (multiplicity 2);



Provide the requested response.

39) Suppose that a polynomial function of degree 4 with rational coefficients has $5i$, $-2 - \sqrt{2}$ as zeros. Find the other zeros.

39) _____

A) $-5i$, $2 + \sqrt{2}$

B) $5 - i$, $-2 + \sqrt{2}$

C) $-5i$, $-2 + \sqrt{2}$

D) $5 - i$, $2 + \sqrt{2}$

Given that the polynomial function has the given zero, find the other zeros.

40) $f(x) = x^3 - 2x^2 - 11x + 52$; -4

40) _____

A) $1 + 2\sqrt{13}i$, $1 - 2\sqrt{13}i$

B) $1 + 2i$, $1 - 2i$

C) $3 + 4i$, $3 - 4i$

D) $3 + 2i$, $3 - 2i$

41) $f(x) = x^4 - 4x^3 + 2x^2 - 4x + 1$; i

A) $-i, 1 + \sqrt{3}, 1 - \sqrt{3}$

C) $-i, 2 + 2\sqrt{3}, 2 - 2\sqrt{3}$

B) $-i, -2 + \sqrt{3}, -2 - \sqrt{3}$

D) $-i, 2 + \sqrt{3}, 2 - \sqrt{3}$

41) _____

Given the polynomial function $f(x)$, find the rational zeros, then the other zeros (that is, solve the equation $f(x) = 0$), and factor $f(x)$ into linear factors.

42) $f(x) = x^4 + 18x^3 + 71x^2 - 18x - 72$

A) $-12, -6, 1$, multiplicity 2; $f(x) = (x + 12)(x + 6)(x - 1)^2$

B) $-12, -6, -1, 1$; $f(x) = (x + 12)(x + 6)(x + 1)(x - 1)$

C) $-1, 1, 6, 12$; $f(x) = (x + 1)(x - 1)(x - 6)(x - 12)$

D) $-6, -1, 1, 12$; $f(x) = (x + 6)(x + 1)(x - 1)(x - 12)$

42) _____

Give all possible rational zeros for the polynomial.

43) $f(x) = x^3 - 7x^2 + 9x - 24$

A) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 24$

B) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 24$

C) $\pm 1, \pm \frac{1}{2}, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 24$

D) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm 24$

43) _____

44) $f(x) = 2x^3 - 5x^2 + 7x - 17$

A) $\pm 1, \pm 2, \pm 17, \pm \frac{17}{2}$

B) $\pm 1, \pm \frac{1}{17}, \pm 2, \pm \frac{2}{17}$

C) $\pm 1, \pm 17, \pm \frac{1}{2}, \pm \frac{17}{2}$

D) $\pm 1, \pm 2, \pm 17$

44) _____

Solve the exponential equation.

45) $3^{(1+2x)} = 27$

A) 9

B) -1

C) 3

D) 1

45) _____

Solve the exponential equation. Express the solution set in terms of natural logarithms.

46) $5^x + 8 = 4$

A) $\left\{ \frac{\ln 4}{\ln 5} - 8 \right\}$

B) $\left\{ \frac{\ln 5}{\ln 4} + 8 \right\}$

C) $\{\ln 4 - \ln 5 - \ln 8\}$

D) $\left\{ \frac{\ln 5}{\ln 4} + \ln 8 \right\}$

46) _____

47) $4^x + 4 = 5^{2x} + 5$

A) $\left\{ \frac{5 \ln 5 - 4 \ln 4}{\ln 4 - 2 \ln 5} \right\}$

B) $\{7 \ln 5 - 5 \ln 4\}$

C) $\left\{ \ln \left[\frac{5^5}{4^4} - \frac{4}{5^2} \right] \right\}$

D) $\{\ln 5 - \ln 4\}$

47) _____

Simplify.

48) $\log_a a^2$ 48) _____
 A) 1 B) $2\log_a a$ C) a^2 D) 2

49) $\log_b \sqrt{b^3}$ 49) _____
 A) $\frac{3}{2}$ B) 3 C) $\frac{1}{2}$ D) 2

50) $e^{\ln x^{42}}$ 50) _____
 A) x B) $\ln x^{42}$ C) $e^{x^{42}}$ D) x^{42}

Solve the logarithmic equation.

51) $\log_2(4x - 8) = 3$ 51) _____
 A) $\frac{\log_2 3 + 8}{4}$ B) $\frac{16}{11}$ C) 4 D) 12

52) $\log_4(x - 3) + \log_4(x - 3) = 1$ 52) _____
 A) -5, 5 B) 5 C) $\sqrt{10}$ D) $-\sqrt{10}, \sqrt{10}$

53) $\log(4 + x) - \log(x - 4) = \log 5$ 53) _____
 A) $\emptyset$ B) $\frac{5}{2}$ C) 6 D) -6

Solve the problem.

54) A surveyor is measuring the distance across a small lake. He has set up his transit on one side of the lake 90 feet from a piling that is directly across from a pier on the other side of the lake. From his transit, the angle between the piling and the pier is 35° . What is the distance between the piling and the pier to the nearest foot? 54) _____
 A) 63 feet B) 74 feet C) 52 feet D) 129 feet

55) A straight trail with a uniform inclination of 14° leads from a lodge at an elevation of 500 feet to a mountain lake at an elevation of 7,200 feet. What is the length of the trail (to the nearest foot)? 55) _____
 A) 6,905 feet B) 27,695 feet C) 29,762 feet D) 7,420 feet

A point on the terminal side of angle θ is given. Find the exact value of the indicated trigonometric function of θ .

56) (2, -3) Find $\sin \theta$. 56) _____
 A) $\frac{\sqrt{13}}{2}$ B) -3 C) $-\frac{3\sqrt{13}}{13}$ D) $\frac{2\sqrt{13}}{13}$

57) (-3, -2) Find $\sec \theta$. 57) _____
 A) $\frac{\sqrt{13}}{2}$ B) $\frac{2}{3}$ C) $-\frac{\sqrt{13}}{3}$ D) $-\frac{3\sqrt{13}}{13}$

Find the exact value of the indicated trigonometric function of θ .

58) $\cot \theta = -\frac{9}{10}$, $\cos \theta < 0$

Find $\csc \theta$.

58) _____

A) $-\frac{\sqrt{181}}{9}$

B) $\frac{9\sqrt{181}}{181}$

C) $\frac{\sqrt{181}}{10}$

D) $-\frac{9\sqrt{181}}{181}$

Use reference angles to find the exact value of the expression. Do not use a calculator.

59) $\sec \frac{3\pi}{4}$

59) _____

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

B) -2

C) $-\sqrt{2}$

D) $-\frac{2\sqrt{3}}{3}$

60) $\csc 600^\circ$

60) _____

A) $-\sqrt{2}$

B) $-\sqrt{3}$

C) $-\frac{2\sqrt{3}}{3}$

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