NAME:_____ MA'AYANOT YESHIVA HICH SCHOOL
R. BERNSTEIN, MATHEMATICS

2018 SUMMER MATH PACKET FOR STUDENTS TAKING PRECALCULUS

CONGRATULATIONS ON ALL OF YOUR MATH ACHIEVEMNT DURING THE PAST YEARS!!!

THIS PACKET CONTAINS A REVIEW OF MANY OF THE CONCEPTS THAT YOU HAVE LEARNED AND ARE ESSENTIAL TO YOUR PROGRESS AND SUCCESS IN PRECALCULUS AND ALL OF YOUR FUTURE MATH COURSES.

INSTRUCTIONS:

- USE PAGES 2-8 TO SHOW YOUR WORK FOR EACH OF THE ODD NUMBERED PROBLEMS. (You are not required to do the even problems)
- Once you have shown your work, select the correct letter choice and write it in the box with your work
- Hand in pages 2-8 to your teacher on the first day of school.

Have a great summer and we look forward to seeing you in the Fall!

The Math Department

Name:_____

1)	**9)**
3)	**11)**
5)	**13)**
7)	**15)**

17)	**25)**
19)	**27)**
21)	**29)**
23)	**31)**

33)	**41))**
35)	**43)**
37)	**45)**
39)	**47)**

49)	**57)**
51)	**59)**
53)	**61)**
55)	**63)**

65)	**73)**
67)	**75)**
69)	**77)**
71)	**79)**

81)	**89)**
83)	**91)**
85)	**93)**
87)	**95)**

97)	**99)**

Multiple Choice with Work Shown: On the separate answer sheet, show your work neatly and state the letter of the correct choice.

1. **Reduce the rational expression to lowest terms.**

$$\frac{2x^2 - 9x + 10}{3x^2 - 4x - 4}$$

a. $\frac{2x - 2}{3x + 2}$

b. $\frac{2x - 5}{3x + 2}$

c. $\frac{x - 4}{x + 3}$

d. $\frac{x + 5}{x - 2}$

2. **Reduce the rational expression to lowest terms.**

$$\frac{5x^2 + 15x^3}{12x + 36x^2}$$

a. $\frac{5}{12}$

b. $\frac{5x^2 + 15x^3}{12x + 36x^2}$

c. $\frac{5x}{12}$

d. $\frac{5 + 15x^3}{12x + 36}$

3. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{5x}{10x + 5} \bullet \frac{4x + 2}{3}$$

a. $\frac{2x}{3}$

b. $\frac{2x}{15}$

c. $\frac{x}{3}$

d. $\frac{2}{3}$

4. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{9x^4 - 72x}{3x^2 - 12} \bullet \frac{x^2 + x - 2}{4x^3 + 8x^2 + 16x}$$

a. $\frac{3(x - 1)}{4}$

b. $\frac{3x(x - 1)}{4}$

c. $\frac{3x(x - 1)(x - 2)^2}{4(x + 2)^2}$

d. $\frac{3x(x + 1)}{4}$

5. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{\frac{9x-9}{2}}{\frac{3x-3}{22}}$$

a. $\frac{1}{33}$

b. $\frac{27(x-1)^2}{44}$

c. $\frac{11(9x-9)}{3x-3}$

d. 33

6. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{\frac{x^2-14x+49}{10x-70}}{\frac{5x-35}{50}}$$

a. 50

b. 1

c. $\frac{x^2-14x+49}{(x-7)^2}$

d. $\frac{(x-7)^2}{100}$

7. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{7}{11x} - \frac{5}{11x}$$

a. $\frac{1}{11x}$

b. $\frac{11}{2x}$

c. $\frac{2}{11x}$

d. 1

8. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{6-x}{x-3} - \frac{2x+1}{3-x}$$

a. $\frac{x+5}{x-3}$

c. $-\frac{x+5}{x-3}$

b. $-\frac{x+7}{x-3}$

d. $\frac{x+7}{x-3}$

9. **Find the LCM of the given polynomials.**

$x^2 + 5x + 6,\ x^2 - 4x - 12$

a. $(x + 3)(x + 2)(x - 6)$

b. $(x - 3)(x - 2)(x - 6)$

c. $(x + 2)(x - 6)$

d. $(x + 3)(x + 2)$

10. **Find the LCM of the given polynomials.**

$x^2 - 4x,\ (x - 4)^2$

a. $x(x - 4)^2$

b. $x(x + 4)^2$

c. $x(x - 4)$

d. $(x + 4)(x - 4)^2$

11. **Perform the indicated operations and simplify the result. Leave the answer in factored form.**

$$\frac{\frac{4}{x} + \frac{9}{x^2}}{\frac{16}{x^2} - \frac{81}{x}}$$

a. $\frac{4x^2 + 9}{16 - 81x}$

b. $\frac{1}{4 - 9x}$

c. $\frac{4x + 9}{16 - 81x}$

d. $\frac{1}{4x - 9}$

12. **Solve the equation.**

$\frac{5}{3} - \frac{1}{5}x = \frac{11}{15}$

a. $\left\{-\frac{14}{3}\right\}$

b. $\left\{-\frac{14}{5}\right\}$

c. $\left\{\frac{14}{5}\right\}$

d. $\left\{\frac{14}{3}\right\}$

13. **Solve the equation.**

$(x + 2)(x - 1) = (x + 1)^2$

a. $\{-2\}$

c. $\{-3\}$

b. $\left\{\frac{3}{2}\right\}$

d. $\{3\}$

14. **Solve the equation.**

$x(x^2 + 7) = 3 + x^3$

a. $\left\{\frac{7}{3}\right\}$

b. $\{3\}$

c. $\{7\}$

d. $\left\{\frac{3}{7}\right\}$

15. **Solve the equation.**

$\frac{-2}{x-6} = \frac{-3}{x+2}$

a. {-22}

b. {3}

c. {22}

d. {-14}

16. **Solve the equation by factoring.**

$x^2 - 4x - 32 = 0$

a. {4, -8}

b. {-4, -8}

c. {4, 8}

d. {-4, 8}

17. **Solve the equation by factoring.**

$12x^2 - 5x - 25 = 0$

a. $\left\{\frac{5}{4}, \frac{5}{3}\right\}$

b. $\left\{-\frac{5}{4}, \frac{5}{3}\right\}$

c. $\left\{\frac{5}{4}, -\frac{5}{3}\right\}$

d. $\left\{-\frac{5}{4}, -\frac{5}{3}\right\}$

18. **Solve the equation by factoring.**

$\frac{x-7}{x} = \frac{48}{x+7}$

a. {49, -1}

b. {7, -1}

c. {49, 1}

d. {7, 1}

19. **Solve the equation by the Square Root Method.**

$x^2 = 2$

a. $\{\sqrt{2}\}$
b. $\{\sqrt{2}, -\sqrt{2}\}$
c. $\{2, -2\}$
d. no real solution

20. **Solve the equation by the Square Root Method.**

$(x + 3)^2 = 10$

a. $\{7\}$
b. $\{\sqrt{10}, -\sqrt{10}\}$
c. $\{-3 + \sqrt{10}, -3 - \sqrt{10}\}$
d. $\{3 + \sqrt{10}, 3 - \sqrt{10}\}$

21. **Solve the equation by completing the square.**

$x^2 - 4x - 7 = 0$

a. $\{-2 - \sqrt{11}, -2 + \sqrt{11}\}$
b. $\{2 - \sqrt{7}, 2 + \sqrt{7}\}$
c. $\{2 - \sqrt{11}, 2 + \sqrt{11}\}$
d. $\{4 - \sqrt{23}, 4 + \sqrt{23}\}$

22. **Solve the equation by completing the square.**

$x^2 + 5x - 5 = 0$

a. $\left\{\frac{-5 - 3\sqrt{5}}{2}\right\}$
b. $\left\{\frac{-5 - 3\sqrt{5}}{2}, \frac{-5 + 3\sqrt{5}}{2}\right\}$
c. $\{-5 - 3\sqrt{5}, -5 + 3\sqrt{5}\}$
d. $\left\{\frac{5 + 3\sqrt{5}}{2}\right\}$

23. **Find the real solutions, if any, of the equation. Use the quadratic formula.**

$x^2 + x + 1 = 0$

a. $\left\{\frac{-1 - \sqrt{3}}{2}, \frac{-1 + \sqrt{3}}{2}\right\}$
b. $\left\{\frac{-1 - \sqrt{3}}{2}, \frac{1 + \sqrt{3}}{2}\right\}$
c. no real solution
d. $\left\{\frac{1 - \sqrt{3}}{2}, \frac{1 + \sqrt{3}}{2}\right\}$

24. **Find the real solutions, if any, of the equation. Use the quadratic formula.**

$4x = 1 + \frac{-6}{x}$

a. $\left\{\frac{1-\sqrt{97}}{8}\right\}$
b. $\left\{-\frac{1+\sqrt{97}}{8}, \frac{1-\sqrt{97}}{8}\right\}$
c. no real solution
d. $\left\{\frac{1-\sqrt{97}}{8}, \frac{1+\sqrt{97}}{8}\right\}$

25. **Use the discriminant to determine whether the quadratic equation has two unequal real solutions, a repeated real solution, or no real solution without solving the equation.**

$x^2 + 3x + 5 = 0$

a. repeated real solution
b. no real solution
c. two unequal real solutions

26. **Find the real solutions of the equation.**

$x^4 - 81 = 0$

a. $\{-\sqrt{3}, \sqrt{3}\}$
b. no real solution
c. {-9, 9}
d. {-3, 3}

27. **Solve the equation.**

$|x + 6| = 6$

a. {-12, 0}
b. {12, 0}
c. no real solution
d. {0}

28. **Find the real solutions of the equation by factoring.**

$x^3 - 100x = 0$

a. {0, -10}
b. {0, 100}
c. {0, 10}
d. {0, 10, -10}

29. **Write the expression in the standard form a + bi.**

(4 + 7i) - (-5 + i)

a. -1 + 8i
b. 9 + 6i
c. 9 - 6i
d. -9 - 6i

30. **Write the expression in the standard form a + bi.**

$\frac{7 + 9i}{4 - 3i}$

a. $\frac{55}{7} - \frac{57}{7}i$
b. $\frac{1}{7} - \frac{57}{7}i$
c. $\frac{1}{25} + \frac{57}{25}i$
d. $\frac{11}{5} - \frac{3}{5}i$

31. **Write the expression in the standard form a + bi.**

$(1 - 8i)^2$

a. $1 - 16i + 64i^2$
b. $65 - 16i$
c. -63
d. $-63 - 16i$

32. **Write the expression in the standard form a + bi.**

$2i^{15} - i^7$

a. i
b. -1
c. $-i$
d. 1

33. **Solve the equation in the complex number system.**

$x^2 + 12x + 72 = 0$

a. $\{-6 + 6i, -6 - 6i\}$
b. $\{-6 + 6i\}$
c. $\{0, -12\}$
d. $\{-6 - 36i, -6 + 36i\}$

34. **Solve the equation in the complex number system.**

$x^4 - 81 = 0$

a. $\{-3, 3, 3i\}$
b. $\{-3, 3\}$
c. $\{-3, 3, -3i, 3i\}$
d. $\{3\}$

35. **Without solving, determine the character of the solutions of the equation in the complex number system.**

$3x^2 - 6x + 3 = 0$

a. two unequal real solutions
b. two complex solutions that are conjugates of each other
c. a repeated real solution

36. **Translate the sentence into a mathematical equation. Be sure to identify the meaning of all symbols.**

Speed is measured by distance divided by time.

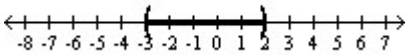
a. If S represents speed, d distance, and t time, then $S = \frac{t}{d}$.

b. If S represents speed, d distance, and t time, then $t = \frac{S}{d}$.

c. If S represents speed, d distance, and t time, then $S = \frac{d}{t}$.

d. If S represents speed, d distance, and t time, then $d = \frac{S}{t}$.

37. **Express the graph shown using interval notation. Also express it as an inequality involving x.**



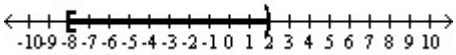
a. $[-3, 2)$
$-3 \le x < 2$

b. $(-3, 2]$
$-3 < x \le 2$

c. $[-3, 2]$
$-3 \le x \le 2$

d. $(-3, 2)$
$-3 < x < 2$

38. **Express the graph shown using interval notation. Also express it as an inequality involving x.**



a. $[-8, 2]$
$-8 \le x \le 2$

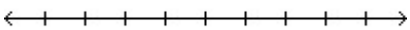
b. $(-8, 2]$
$-8 < x \le 2$

c. $(-\infty, 2)$
$x < 2$

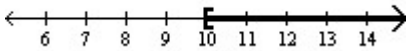
d. $[-8, 2)$
$-8 \le x < 2$

39. **Write the inequality using interval notation, and illustrate the inequality using the real number line.**

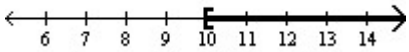
$t \ge 10$



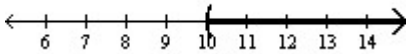
a. $[10, \infty)$



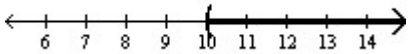
b. $[10, \infty]$



c. $(10, \infty)$

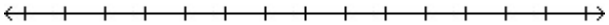


d. (10, ∞]

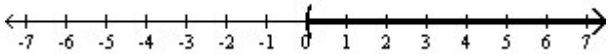


40. **Solve the inequality. Express your answer using interval notation.**

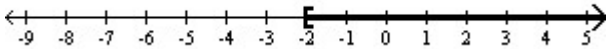
$5x + 1 \geq 4x - 1$



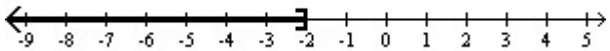
a. (0, ∞)



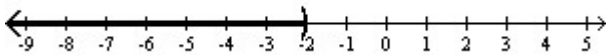
b. [-2, ∞)



c. (-∞, -2]

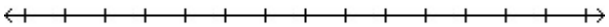


d. (-∞, –2)

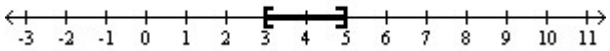


41. **Solve the inequality. Express your answer using interval notation.**

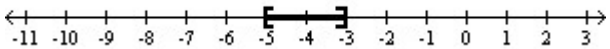
$11 \leq 4x - 1 \leq 19$



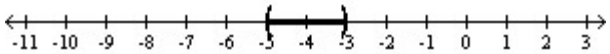
a. [3, 5]



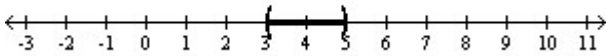
b. [-5, -3]



c. (-5, -3)



d. (3, 5)



42. **Solve the problem.**

In his algebra class, Rob has scores of 79, 85, 81, and 65 on his first four tests. To get a grade of C, the average of the first five tests must be greater than or equal to 70 and less than 80. Solve an inequality to find the range of scores that Rob can earn on the fifth test to get a C.

a. $40 \le x \le 90$, where x represents Bob's score on the fifth test
b. $40 \le x < 90$, where x represents Bob's score on the fifth test
c. $40 < x < 90$, where x represents Bob's score on the fifth test
d. $x \ge 40$, where x represents Bob's score on the fifth test

43. **Solve the inequality. Express your answer using interval notation.**

$|x| > -9$

a. $(-\infty, \infty)$
b. $\{9\}$
c. no solution
d. $(-9, 9)$

44. **Solve the inequality. Express your answer using interval notation.**

$|5x + 2| > 3$

a. $(-\infty, -1)$ or $\left(\frac{1}{5}, \infty\right)$
b. $(-\infty, -1]$ or $\left[\frac{1}{5}, \infty\right)$
c. $\left(-1, \frac{1}{5}\right)$
d. $\left[-1, \frac{1}{5}\right]$

45. **Solve the inequality. Express your answer in set notation.**

$x^2 > 16$

a. $\{x \mid -4 \le x \le 4\}$
b. $\{x \mid x < -4 \text{ or } x > 4\}$
c. $\{x \mid x < -4 \text{ or } x \ge 4\}$
d. $\{x \mid x \le -4 \text{ or } x \ge 4\}$

46. **Simplify the expression. Assume that all variables are positive when they appear.**

$\sqrt{425}$

a. $25\sqrt{17}$
b. 85
c. $\sqrt{425}$
d. $5\sqrt{17}$

47. **Simplify the expression. Assume that all variables are positive when they appear.**

$\sqrt{16y^{24}}$

a. $4y^{12}$
b. $4y^{22}$
c. $16y^{12}$
d. $4y^{24}$

48. **Simplify the expression. Assume that all variables are positive when they appear.**

$-\sqrt[3]{-125x^{18}y^{24}}$

a. $5x^6y^8$
b. $5x^6y^{12}$
c. $25x^6y^8$
d. $-5x^{18}y^8$

49. **Simplify the expression. Assume that all variables are positive when they appear.**

$\frac{5}{\sqrt{11}}$

a. 126
b. $\frac{25\sqrt{11}}{11}$
c. $5\sqrt{11}$
d. $\frac{5\sqrt{11}}{11}$

50. **Simplify the expression.**

$27^{4/3}$

a. 243
b. 81
c. 729
d. 2187

51. **Simplify the expression.**

$243^{4/5}$

a. 19,683
b. 81
c. 6561
d. 2187

52. **Simplify the expression. Express the answer so that only positive exponents occur. Assume that all variables are positive.**

$(16x^8y^4)^{1/2}$

a. $4x^4y^2$
b. $4x^8y^2$
c. x^4y^2
d. $4x^4y$

53. **Simplify the expression. Express the answer so that only positive exponents occur. Assume that all variables are positive.**

$(x^2y^3)^{5/4}$

a. $x^{15/4}y^{5/2}$
b. $x^{8/5}y^{12/5}$
c. $x^{5/2}y^{15/4}$
d. $x^{13/4}y^{17/4}$

54. **Solve the problem.**

A freight train leaves a station traveling at 32 km/h. Two hours later, a passenger train leaves the same station traveling in the same direction at 52 km/h. How long does it takes the passenger train to catch up to the freight train?

a. 2.2 hr
b. 4.2 hr
c. 3.2 hr
d. 5.2 hr

55. **Solve the problem.**

Five friends drove at an average rate of 50 miles per hour to a weekend retreat. On the way home, they took the same route but averaged 65 miles per hour. What was the distance between home and the retreat if the round trip took 10 hours?

a. $2166\frac{2}{3}$ mi

b. $565\frac{5}{23}$ mi

c. $5\frac{15}{23}$ mi

d. $282\frac{14}{23}$ mi

56. **Solve the problem.**
Tracy can wallpaper 2 rooms in a new house in 10 hours. Together with her trainee they can wallpaper the 2 rooms in 7 hours. How long would it take the trainee working by herself to do the job?

a. 32 hr

b. 44 hr

c. 10 hr

d. 22 hr

57. **Solve the problem.**
Brandon can paint a fence in 12 hours and Elaine can paint the same fence in 11 hours. How long will they take to paint the fence if they work together?

a. $5\frac{3}{4}$ hr

b. $5\frac{13}{24}$ hr

c. $5\frac{17}{23}$ hr

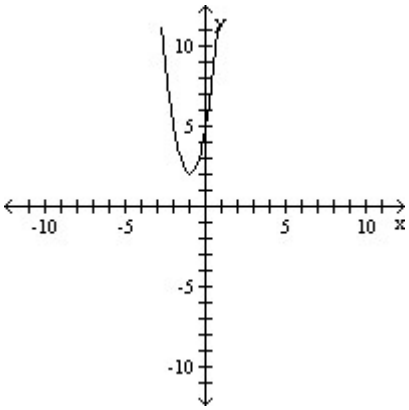
d. $11\frac{1}{2}$ hr

58. **Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.**

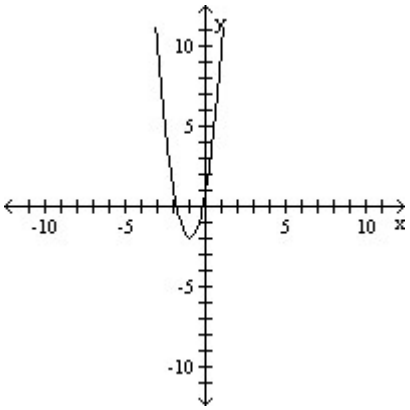
$f(x) = 3(x + 1)^2 + 2$

a.

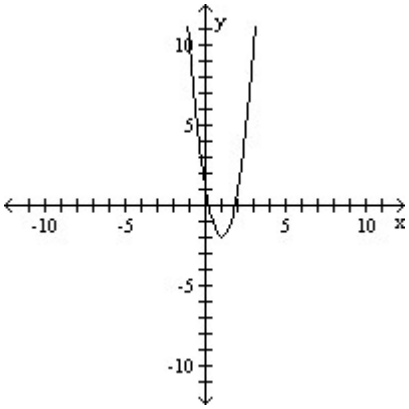
c.

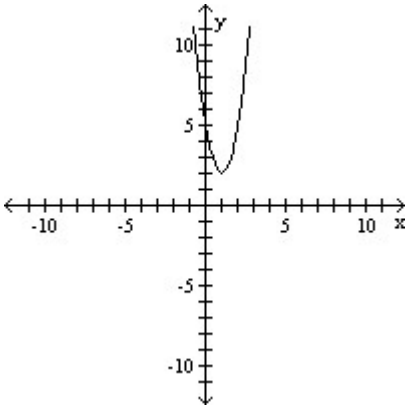


b.



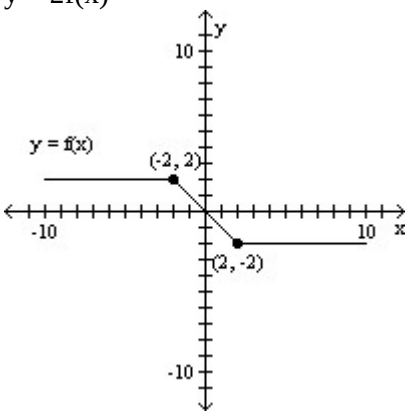
d.

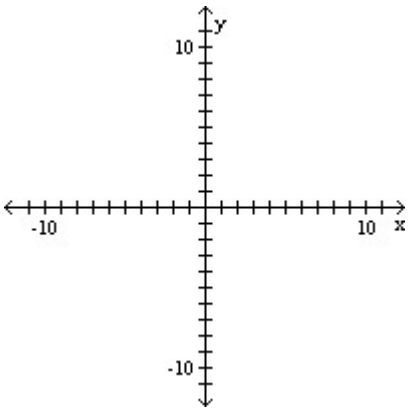




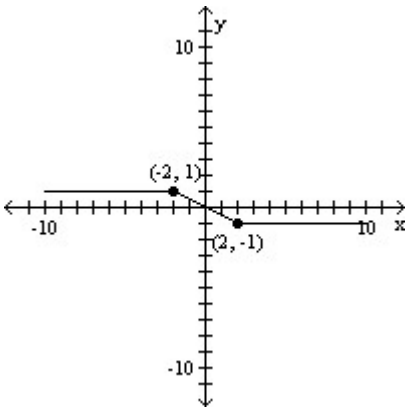
59. **Use the accompanying graph of y = f(x) to sketch the graph of the indicated equation.**

y = 2f(x)

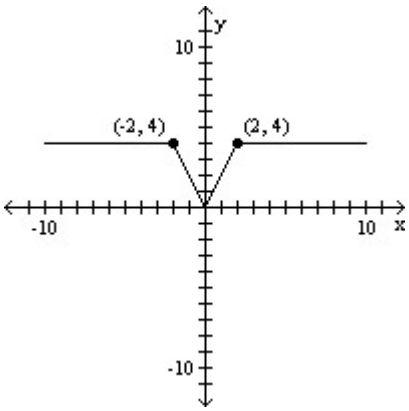

y = f(x)
(-2, 2)
(2, -2)
10
-10
x
y


10
-10
x
y

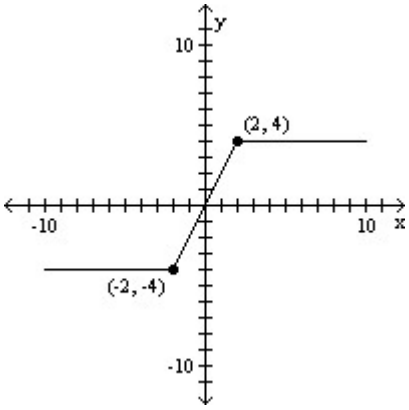
a.


(-2, 1)
(2, -1)
10
-10
x
y

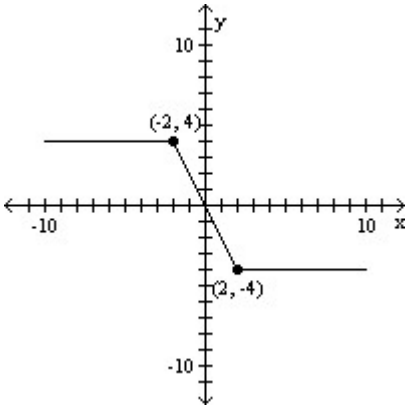
c.


(-2, 4)
(2, 4)
10
-10
x
y

b.

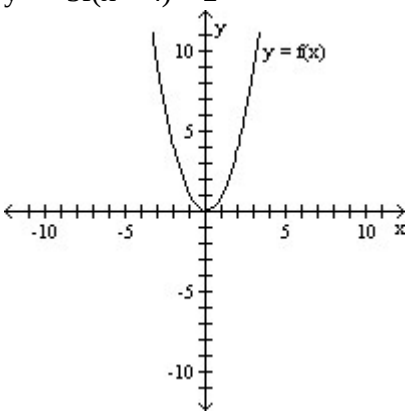

(2, 4)
(-2, -4)
10
-10
x
y

d.

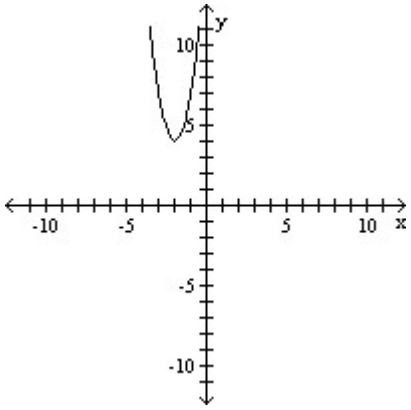

(-2, 4)
(2, -4)
10
-10
x
y

60. **Use the accompanying graph of y = f(x) to sketch the graph of the indicated equation.**

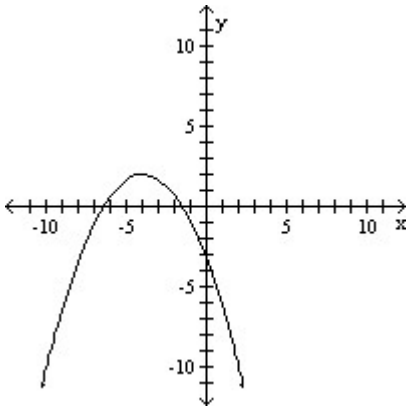
y = - 3f(x + 4) + 2

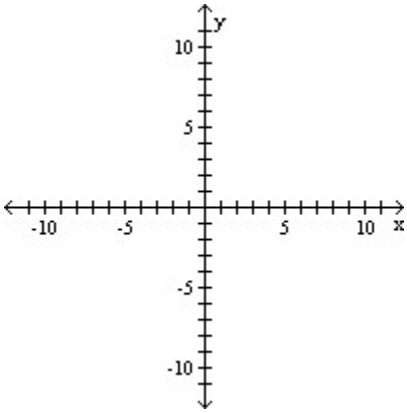


a.

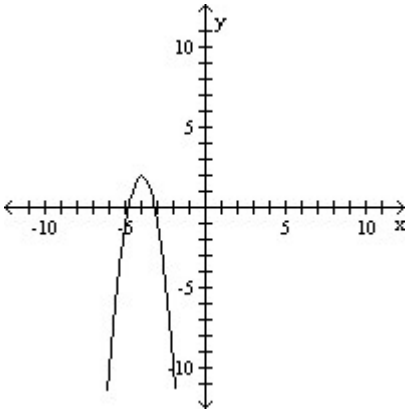


b.

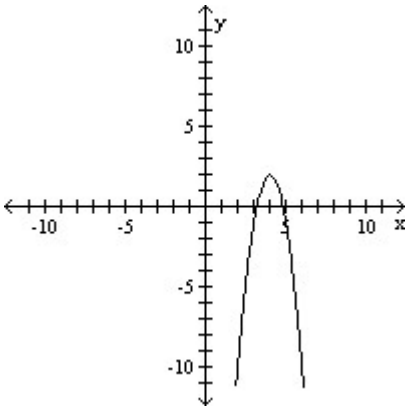




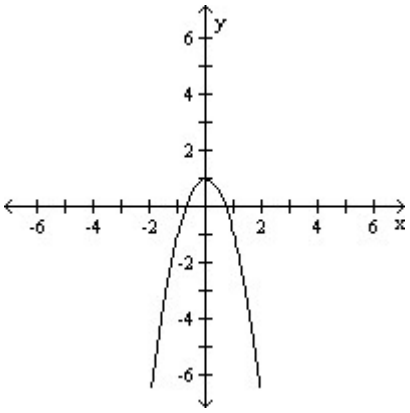
c.



d.



61. **Match the correct function to the graph.**



a. $y = 1 - x^2$
b. $y = -2x^2$
c. $y = -2x^2 - 1$
d. $y = -2x^2 + 1$

62. **Find the function.**

Find the function that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$. The graph is shifted down 5 units, reflected about the y-axis, and finally shifted left 2 units.

a. $y = \sqrt{-x + 2} - 5$
b. $y = -\sqrt{x - 2} + 5$
c. $y = \sqrt{-x - 2} - 5$
d. $y = \sqrt{-x + 2} + 5$

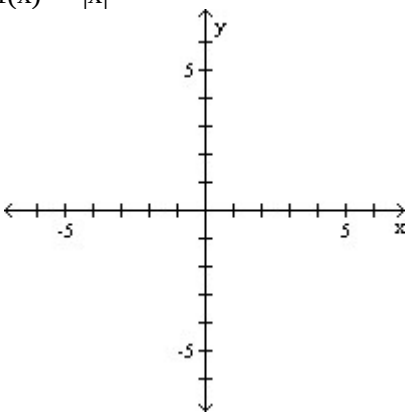
63. **Find the function.**

Find the function that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$. The graph is shifted up 5 units, reflected about the x-axis, and finally shifted right 4 units.

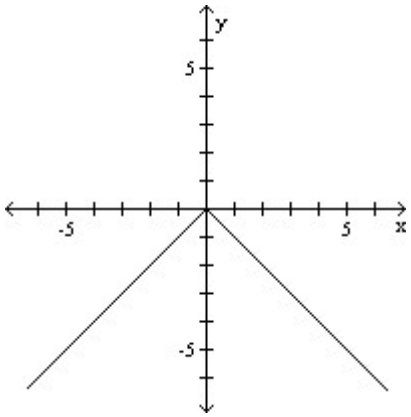
a. $y = \sqrt{-x + 4} - 5$
b. $y = -\sqrt{x + 4} + 5$
c. $y = -\sqrt{x - 4} - 5$
d. $y = -\sqrt{x - 4} + 5$

64. **Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.**

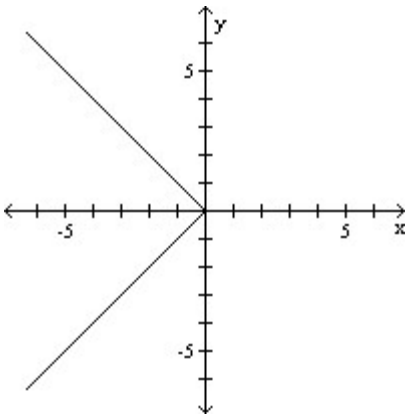
f(x) = -|x|



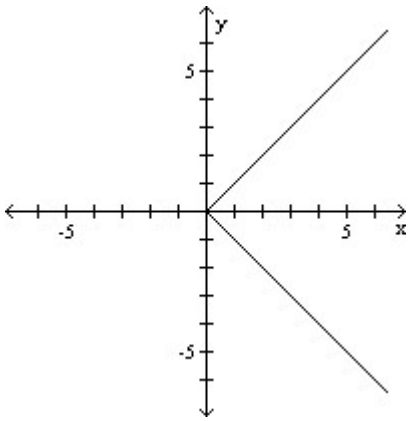
a.



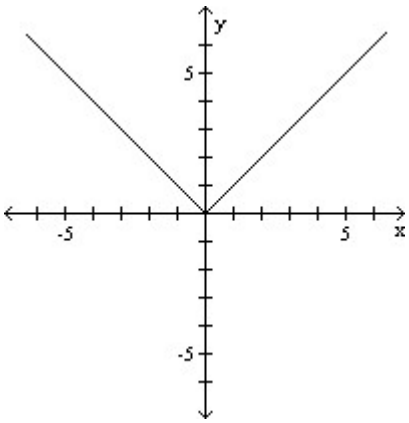
c.



b.

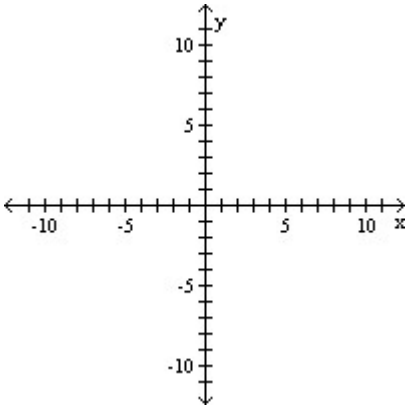


d.

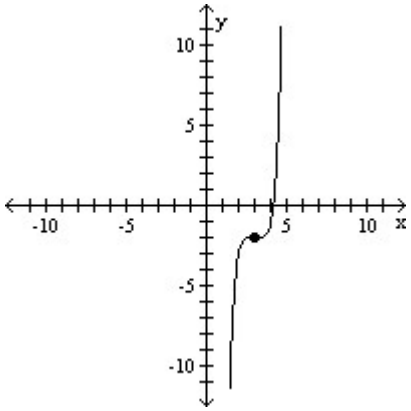


65. **Use transformations of the graph of $y = x^4$ or $y = x^5$ to graph the function.**

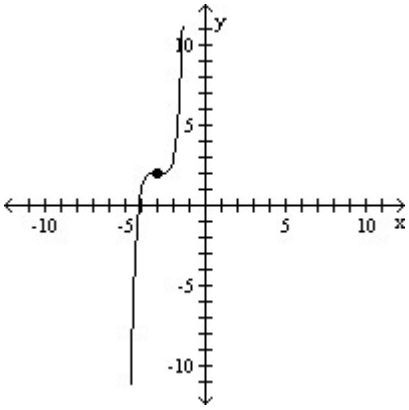
$f(x) = (x - 3)^5 + 2$



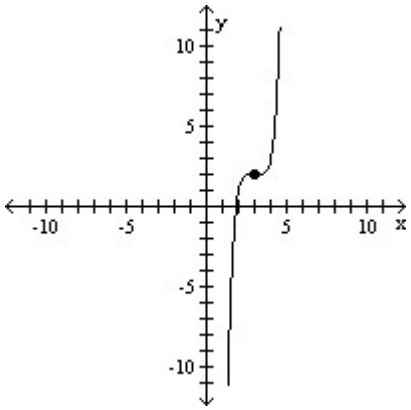
a.



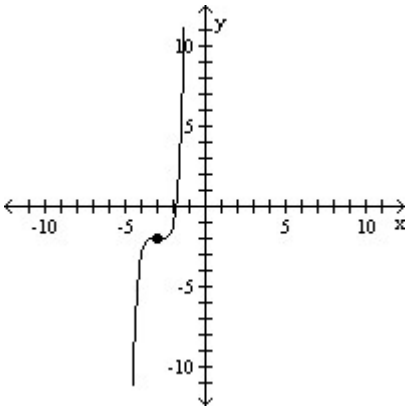
c.



b.

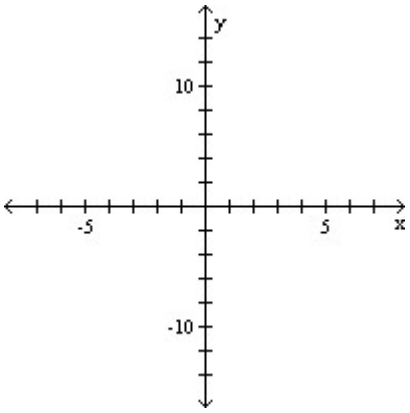


d.

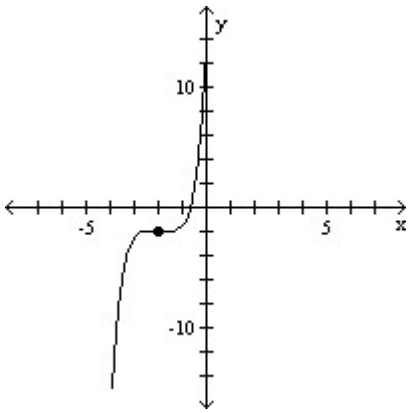


66. **Use transformations of the graph of $y = x^4$ or $y = x^5$ to graph the function.**

$f(x) = \frac{1}{2}(x - 2)^5 + 2$

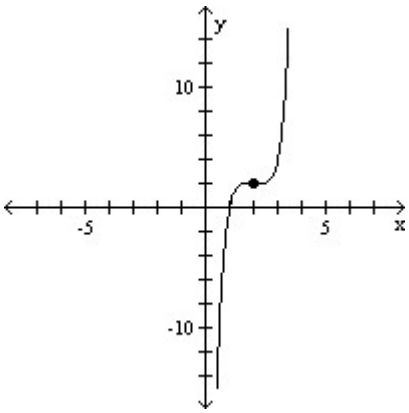


a.

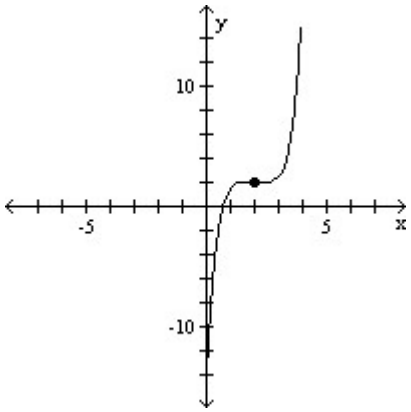


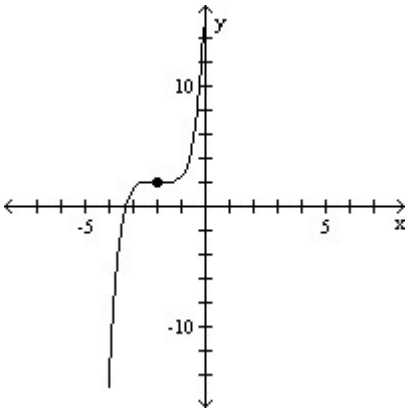
b.

c.



d.

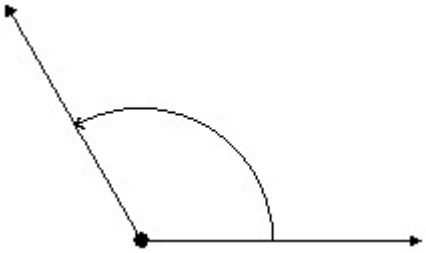




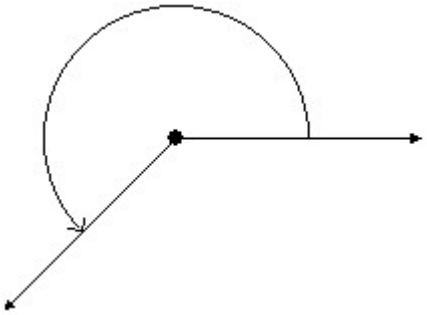
67.**Draw the angle.**

135°

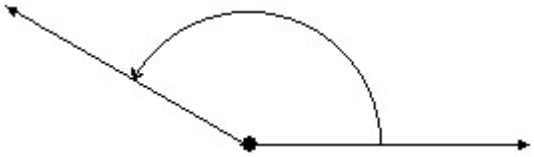
a.



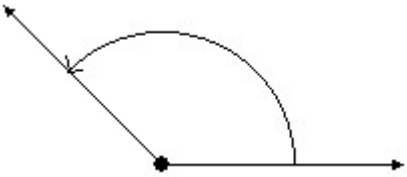
c.



b.



d.

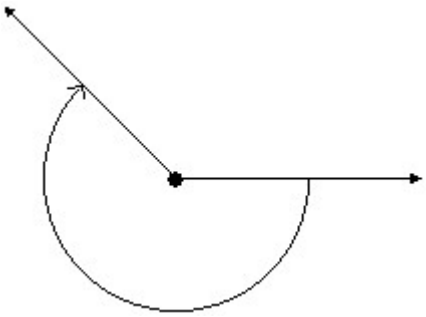


68.**Draw the angle.**

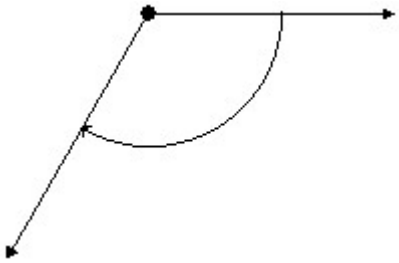
-120°

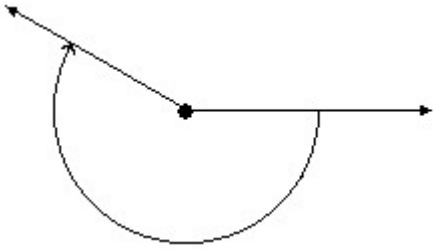
a.

c.

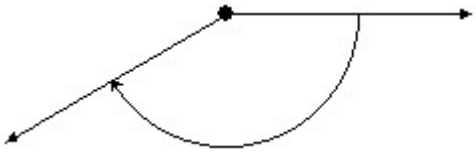


b.





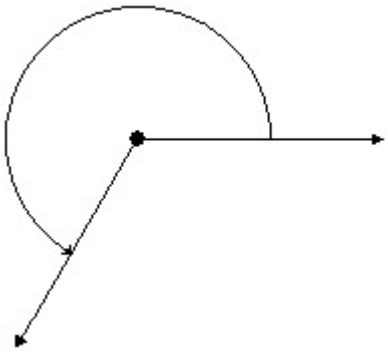
d.



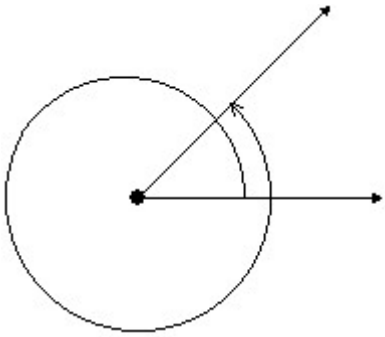
69.**Draw the angle.**

$\frac{7\pi}{4}$

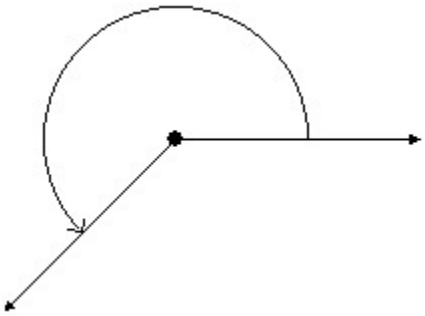
a.



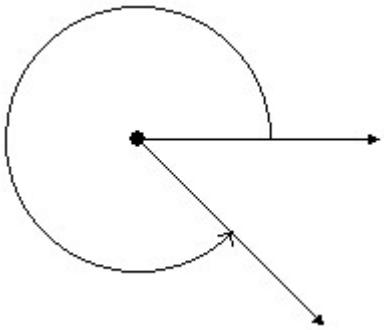
b.



c.



d.



70. **If s denotes the length of the arc of a circle of radius r subtended by a central angle θ, find the missing quantity. Round to one decimal place, if necessary.**

r = 12.17 centimeters, θ = 1.8 radians, s = ?

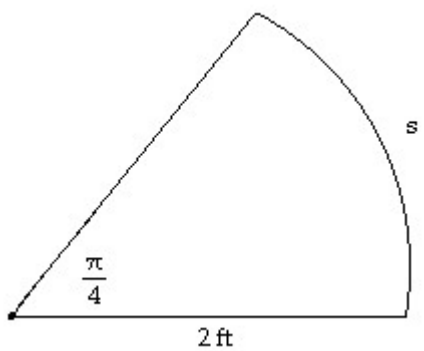
a. 22.9 cm
b. 23.9 cm
c. 20.9 cm
d. 21.9 cm

71. **If s denotes the length of the arc of a circle of radius r subtended by a central angle θ, find the missing quantity. Round to one decimal place, if necessary.**

r = 14.8 inches, θ = 315°, s = ?

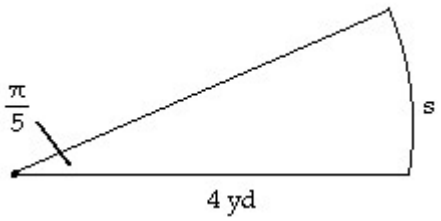
a. 81.5 in.
b. 81.6 in.
c. 81.4 in.
d. 81.7 in.

72. **Find the length s. Round the answer to three decimal places.**



a. 6.283 ft
b. 2.546 ft
c. 3.142 ft
d. 1.571 ft

73. **Find the length s. Round the answer to three decimal places.**



a. 5.026 yd
b. 6.366 yd
c. 2.513 yd
d. 3.927 yd

74. **Solve the problem.**

For a circle of radius 4 feet, find the arc length s subtended by a central angle of 60°. Round to the nearest hundredth.

a. 4.35 ft
b. 4.40 ft
c. 4.25 ft
d. 4.19 ft

75. **Convert the angle in degrees to radians. Express the answer as multiple of π.**

36°

a. $\frac{\pi}{5}$
b. $\frac{\pi}{4}$
c. $\frac{\pi}{7}$
d. $\frac{\pi}{6}$

76. **Convert the angle in degrees to radians. Express the answer as multiple of π.**

-90°

a. $-\frac{\pi}{8}$
b. $-\frac{\pi}{3}$
c. $-\frac{\pi}{4}$
d. $-\frac{\pi}{2}$

77. **Convert the angle in radians to degrees.**

$\frac{12\pi}{7}$

a. 309.57°
b. 307.57°
c. 310.57°
d. 308.57°

78. **Convert the angle in radians to degrees.**

$-\frac{5\pi}{12}$

a. -74°
c. -76°

b. -77°
d. -75°

79. **Solve the problem.**

A wheel of radius 8.3 feet is moving forward at 19 feet per second. How fast is the wheel rotating?

a. 6 radians/sec
b. 0.38 radians/sec
c. 2.3 radians/sec
d. 0.44 radians/sec

80. **Solve the problem.**

A car is traveling at 49 mph. If its tires have a diameter of 24 inches, how fast are the car's tires turning? Express the answer in revolutions per minute. If necessary, round to two decimal places.

a. 4312 rpm
b. 1372.55 rpm
c. 686.27 rpm
d. 666.27 rpm

81. **In the problem, t is a real number and P = (x, y) is the point on the unit circle that corresponds to t. Find the exact value of the indicated trigonometric function of t.**

$(\frac{4}{7}, \frac{\sqrt{33}}{7})$ Find sin t.

a. $\frac{\sqrt{33}}{4}$
b. $\frac{4\sqrt{33}}{33}$
c. $\frac{4}{7}$
d. $\frac{\sqrt{33}}{7}$

82. **In the problem, t is a real number and P = (x, y) is the point on the unit circle that corresponds to t. Find the exact value of the indicated trigonometric function of t.**

$(\frac{\sqrt{11}}{6}, \frac{5}{6})$ Find sec t.

a. $\frac{6\sqrt{11}}{11}$
b. $\frac{\sqrt{11}}{5}$
c. $\frac{5\sqrt{11}}{11}$
d. $\frac{6}{5}$

83. **In the problem, t is a real number and P = (x, y) is the point on the unit circle that corresponds to t. Find the exact value of the indicated trigonometric function of t.**

$(\frac{4}{9}, -\frac{\sqrt{65}}{9})$ Find csc t.

a. $\frac{\sqrt{65}}{9}$

b. $-\frac{9\sqrt{65}}{65}$

c. $-\frac{\sqrt{65}}{9}$

d. $\frac{\sqrt{65}}{4}$

84. **In the problem, t is a real number and P = (x, y) is the point on the unit circle that corresponds to t. Find the exact value of the indicated trigonometric function of t.**

$(\frac{3}{4}, -\frac{\sqrt{7}}{4})$ Find cos t.

a. $\frac{\sqrt{7}}{4}$

b. $-\frac{\sqrt{7}}{4}$

c. $\frac{3}{4}$

d. $-\frac{3}{4}$

85. **Find the exact value. Do not use a calculator.**

tan 0

a. undefined

b. 1

c. 0

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

86. **Find the exact value. Do not use a calculator.**

cot 0

a. $\frac{\sqrt{2}}{2}$

b. 1

c. undefined

d. 0

87. **Find the exact value. Do not use a calculator.**

cos π

a. 0

b. undefined

c. -1

d. 1

88. **Find the exact value. Do not use a calculator.**

cot $\frac{3\pi}{2}$

a. undefined
b. -1
c. 1
d. 0

89. **Find the exact value. Do not use a calculator.**

sin $\frac{\pi}{4}$

a. $\frac{1}{2}$
b. $\sqrt{2}$
c. $-\frac{\sqrt{2}}{2}$
d. $\frac{\sqrt{2}}{2}$

90. **Find the exact value of the expression if θ = 45°. Do not use a calculator.**

$g(\theta) = \sin\theta$ Find $[g(\theta)]^2$.

a. 2
b. $\sqrt{2}$
c. $\frac{1}{2}$
d. $-\frac{\sqrt{2}}{2}$

91. **Find the exact value of the expression if θ = 45°. Do not use a calculator.**

$g(\theta) = \sin\theta$ Find $6g(\theta)$.

a. $3\sqrt{2}$
b. $-6\sqrt{2}$
c. $6\sqrt{2}$
d. $-3\sqrt{2}$

92. **Find the exact value. Do not use a calculator.**

sec 30°

a. $\frac{\sqrt{3}}{2}$
b. $\frac{2\sqrt{3}}{3}$
c. $\sqrt{2}$
d. 2

93. **Find the exact value of the expression. Do not use a calculator.**

cos 60° + tan 60°

a. $2\sqrt{3}$
b. $\frac{1+\sqrt{3}}{2}$
c. $\frac{3\sqrt{3}}{2}$
d. $\frac{1+2\sqrt{3}}{2}$

94. **Find the exact value. Do not use a calculator.**

$\cos \frac{16\pi}{3}$

a. $\frac{\sqrt{3}}{2}$

b. $\frac{1}{2}$

c. $-\frac{1}{2}$

d. $-\frac{\sqrt{3}}{2}$

95. **Find the exact value. Do not use a calculator.**

sin 765°

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

b. $\frac{\sqrt{2}}{2}$

c. $-\frac{1}{2}$

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

96. **Find the exact value of the expression. Do not use a calculator.**

cos 120° tan 60°

a. $\frac{3}{2}$

b. $-\frac{\sqrt{3}}{2}$

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

d. $-\frac{1}{4}$

97. **Solve the problem.**

If $\sin \theta = 0.3$, find $\sin (\theta + \pi)$.

a. 0.7

b. 0.3

c. -0.7

d. -0.3

98. **Solve the problem.**

If $\sin \theta = \frac{1}{9}$, find $\csc \theta$.

a. $\frac{8}{9}$

b. $-\frac{1}{9}$

c. 9

d. undefined

99. **Solve the problem.**

What is the range of the cosine function?

a. all real numbers greater than or equal to 0
b. all real numbers from -1 to 1, inclusive
c. all real numbers
d. all real numbers greater than or equal to 1 or less than or equal to -1

100. **Solve the problem.**

What is the range of the tangent function?

a. all real numbers
b. all real numbers greater than or equal to 1 or less than or equal to -1
c. all real numbers, except odd multiples of $\frac{\pi}{2}$ (90)°
d. all real numbers from -1 to 1, inclusive