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

Simplify the exponential expression. Assume that variables represent nonzero real numbers.

1) $\frac{(3x^2)^3}{x^{15}}$ 1) _____

A) $\frac{27}{x^{21}}$ B) $\frac{27}{x^{10}}$ C) $\frac{3}{x^9}$ D) $\frac{27}{x^9}$

2) $(-4x^4y^{-5})(2x^{-1}y)$ 2) _____

A) $\frac{-8x^5}{y^6}$ B) $\frac{-2x^3}{y^4}$ C) $\frac{-8x^3}{y^4}$ D) $-8x^3y^6$

3) $\left(\frac{xy^5}{x^3y}\right)^{-2}$ 3) _____

A) $\frac{1}{x^8y^{12}}$ B) $\frac{x^4}{y^8}$ C) $\frac{1}{x^5y^{11}}$ D) $\frac{y^8}{x^4}$

4) $\left(\frac{12x^{-5}y^{-3}z^4}{3xy^{-3}z^{-4}}\right)^{-1}$ 4) _____

A) $\frac{x^4}{4z^8}$ B) $\frac{x^6}{4z^8}$ C) $\frac{4x^6}{z^8}$ D) $\frac{x^6y^6}{4z^8}$

Use the quotient rule to simplify the expression.

5) $\frac{\sqrt{54x^3}}{\sqrt{6x}}$ 5) _____

A) $6x^2$ B) $3|x|\sqrt{6}$ C) $\frac{3x^2}{\sqrt{6}}$ D) $3|x|$

6) $\frac{\sqrt{56x^4}}{\sqrt{2x}}$ 6) _____

A) $2|x|\sqrt{x}$ B) $56x^3$ C) $2|x|\sqrt{7x}$ D) $\frac{x^2\sqrt{56}}{2}$

Find the product.

7) $(x - 9)(x + 3)$ 7) _____

A) $x^2 - 7x - 27$ B) $x^2 - 27x - 6$ C) $x^2 - 6x - 6$ D) $x^2 - 6x - 27$

8) $(2x + 9)(9x + 11)$ 8) _____

A) $18x^2 + 103x + 103$ B) $18x^2 + 103x + 99$

C) $11x^2 + 103x + 99$ D) $11x^2 + 103x + 103$

9) $(7x^3 - 6)(x^2 - 2)$ 9) _____

A) $7x^6 - 14x^3 - 6x^2 + 12$ B) $7x^5 - 20x^3 + 12$

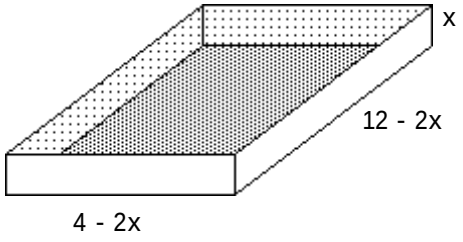
C) $7x^5 - 20x^2 + 12$ D) $7x^5 - 14x^3 - 6x^2 + 12$

10) $(2x + 1)(x - 8)$ 10) _____

A) $2x^2 - 15x - 8$ B) $x^2 - 15x - 16$ C) $2x^2 - 16x - 8$ D) $x^2 - 8x - 15$

Solve the problem.

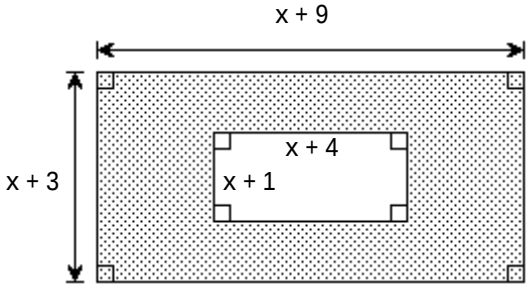
11) Write a polynomial in standard form that represents the volume of the open box. 11) _____



A) $2x^3 - 32x^2 + 48x$ B) $4x^2 - 32x + 48$

C) $4x^3 + 32x^2 + 48x$ D) $4x^3 - 32x^2 + 48x$

12) Write a polynomial in standard form that represents the area of the shaded region. 12) _____



A) $-7x - 23$ B) $7x + 23$ C) $x^2 + 22x + 23$ D) $17x + 31$

Factor the trinomial, or state that the trinomial is prime.

13) $x^2 - 6x + 8$ 13) _____

A) $(x + 2)(x + 1)$ B) $(x - 2)(x - 4)$ C) $(x + 2)(x - 4)$ D) prime

14) $x^2 + 5x - 24$ 14) _____

A) $(x - 8)(x + 1)$ B) $(x + 8)(x - 3)$ C) $(x - 8)(x + 3)$ D) prime

15) $7x^2 + 37x + 36$ 15) _____

A) $(7x + 9)(x + 4)$ B) $(7x + 9)(7x + 4)$ C) $(7x + 4)(x + 9)$ D) prime

16) $5x^2 - 27xy - 18y^2$ 16) _____

A) $y(5x + 3)(x - 6)$ B) $(5x + 6y)(x - 3y)$

C) $(5x + 3y)(x - 6y)$ D) prime

17) $12x^2 + 17xy + 6y^2$ 17) _____

A) $(3x - 2y)(4x - 3y)$ B) $(12x + 2y)(x + 3y)$

C) $(3x + 2y)(4x + 3y)$ D) prime

Multiply or divide as indicated.

18) $\frac{5x}{10x + 5} \cdot \frac{6x + 3}{2}$ 18) _____

A) $\frac{x}{2}$ B) $\frac{3}{2}$ C) $\frac{3x}{10}$ D) $\frac{3x}{2}$

19) $\frac{6x - 2}{2x - 4} \cdot \frac{x - 2}{18x - 6}$ 19) _____

A) $\frac{x - 2}{6(x + 2)}$ B) $\frac{1}{6}$ C) $\frac{1}{3}$ D) 6

20) $\frac{x^3 + 1}{x^3 - x^2 + x} \cdot \frac{9x}{-45x - 45}$ 20) _____

A) $-\frac{1}{5}$ B) $-\frac{x^2 + 1}{5}$ C) $-\frac{x^3 + 1}{5(x + 1)}$ D) $\frac{x + 1}{5(-x - 1)}$

21) $\frac{x^2 + 15x + 56}{x^2 + x - 56} \cdot \frac{x^2 - 64}{x^2 - x - 56}$ 21) _____

A) $\frac{x + 7}{x - 8}$ B) $\frac{x - 8}{x + 7}$ C) $\frac{x - 8}{x - 7}$ D) $\frac{x + 8}{x - 7}$

Add or subtract as indicated.

22) $\frac{3x + 1}{3x + 4} + \frac{3x + 7}{3x + 4}$ 22) _____

A) $\frac{2}{3x + 4}$ B) 1 C) 2 D) $\frac{4x + 5}{3x + 4}$

23) $\frac{x^2 - 9x}{x - 6} + \frac{18}{x - 6}$ 23) _____

A) $x + 3$ B) $\frac{x^2 - 9x + 18}{x - 6}$ C) $x - 3$ D) $x - 6$

24) $\frac{x^2 - 12}{x^2 - 3x - 40} + \frac{2x - 3}{x^2 - 3x - 40}$ 24) _____

A) $\frac{x - 3}{x - 8}$ B) $\frac{(x - 5)(x + 3)}{(x + 5)(x - 8)}$ C) $\frac{x - 3}{x^2 - 3x - 40}$ D) $\frac{x + 5}{x - 8}$

Solve the equation by the square root property.

25) $(2x - 1)^2 = 121$ 25) _____

A) $\{-10, 12\}$ B) $\{-6, 5\}$ C) $\{-5, 6\}$ D) $\{-12, 10\}$

26) $2(x - 4)^2 = 12$ 26) _____

A) $\{-10, 2\}$ B) $\{-4 \pm \sqrt{6}\}$ C) $\{4 \pm \sqrt{6}\}$ D) $\{-2, 10\}$

27) $(5x - 6)^2 = 12$ 27) _____

A) $\left\{\frac{-6 - 2\sqrt{3}}{5}, \frac{-6 + 2\sqrt{3}}{5}\right\}$ B) $\left\{-\frac{6}{5}, \frac{18}{5}\right\}$

C) $\{-2\sqrt{5}, 2\sqrt{5}\}$ D) $\left\{\frac{6 - 2\sqrt{3}}{5}, \frac{6 + 2\sqrt{3}}{5}\right\}$

Solve the equation using the quadratic formula.

28) $2x^2 + 10x + 5 = 0$ 28) _____

A) $\left\{\frac{-5 - \sqrt{15}}{2}, \frac{-5 + \sqrt{15}}{2}\right\}$ B) $\left\{\frac{-5 - \sqrt{35}}{2}, \frac{-5 + \sqrt{35}}{2}\right\}$

C) $\left\{\frac{-10 - \sqrt{15}}{2}, \frac{-10 + \sqrt{15}}{2}\right\}$ D) $\left\{\frac{-5 - \sqrt{15}}{4}, \frac{-5 + \sqrt{15}}{4}\right\}$

29) $2x^2 = -10x - 1$ 29) _____

A) $\left\{\frac{-5 - \sqrt{23}}{4}, \frac{-5 + \sqrt{23}}{4}\right\}$ B) $\left\{\frac{-5 - \sqrt{23}}{2}, \frac{-5 + \sqrt{23}}{2}\right\}$

C) $\left\{\frac{-10 - \sqrt{23}}{2}, \frac{-10 + \sqrt{23}}{2}\right\}$ D) $\left\{\frac{-5 - \sqrt{3}}{2}, \frac{-5 + \sqrt{3}}{2}\right\}$

Solve the problem.

30) A ladder that is 13 feet long is 5 feet from the base of a wall. How far up the wall does the ladder reach? 30) _____

A) $2\sqrt{2}$ ft B) 144 ft C) $\sqrt{194}$ ft D) 12 ft

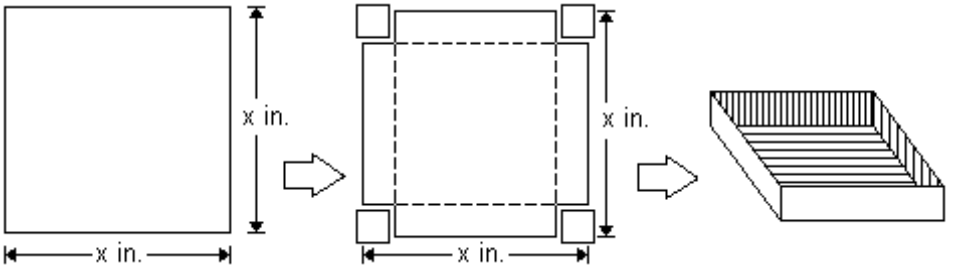
31) The revenue for a small company is given by the quadratic function $r(t) = 9t^2 + 13t + 520$ where t is the number of years since 1998 and r(t) is in thousands of dollars. If this trend continues, find the year after 1998 in which the company's revenue will be $640 thousand. Round to the nearest whole year. 31) _____

A) 2002 B) 2001 C) 2004 D) 2003

32) The length of a rectangular storage room is 3 feet longer than its width. If the area of the room is 88 square feet, find its dimensions. 32) _____

A) 7 feet by 10 feet B) 7 feet by 12 feet C) 8 feet by 11 feet D) 9 feet by 12 feet

33) Suppose that an open box is to be made from a square sheet of cardboard by cutting out 4-inch squares from each corner as shown and then folding along the dotted lines. If the box is to have a volume of 36 cubic inches, find the original dimensions of the sheet of cardboard. 33) _____



A) $\sqrt{3}$ in. by $2\sqrt{3}$ in.
B) 6 in. by 6 in.
C) 3 in. by 3 in.
D) 11 in. by 11 in.

Use graphs to find the set.

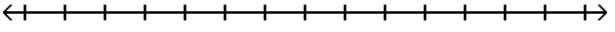
34) $(-8, 0) \cap [-3, 8]$ 34) _____
A) $[-3, 0)$ B) $(-8, -3]$ C) $(0, 8]$ D) $(-8, 8]$

35) $(-\infty, 8) \cap [-3, 19)$ 35) _____
A) $[-3, 8)$ B) $(-\infty, 19)$ C) $(-\infty, -3]$ D) $(8, 19)$

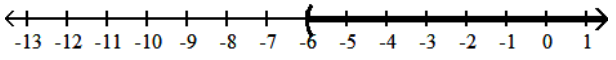
36) $(-\infty, 3) \cup [-2, 19)$ 36) _____
A) $(-\infty, -2]$ B) $(-\infty, 19)$ C) $(3, 19)$ D) $[-2, 3)$

Solve the linear inequality. Other than $\emptyset$, use interval notation to express the solution set and graph the solution set on a number line.

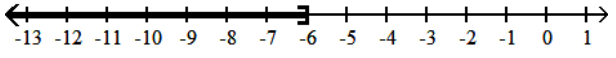
37) $7x - 2 > 6x - 8$ 37) _____



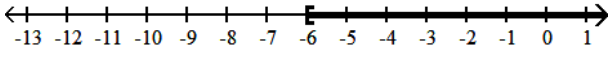
A) $(-6, \infty)$



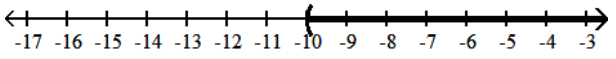
B) $(-\infty, -6]$



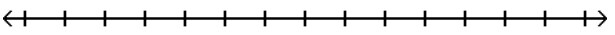
C) $[-6, \infty)$



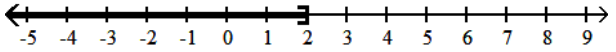
D) $(-10, \infty)$



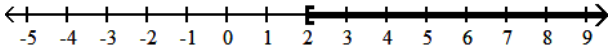
38) $-2x + 6 \geq -3x + 8$ 38) _____



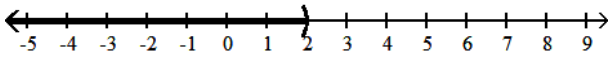
A) $(-\infty, 2]$



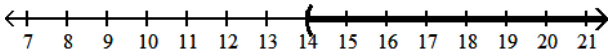
B) $[2, \infty)$



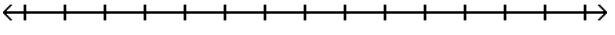
C) $(-\infty, 2)$



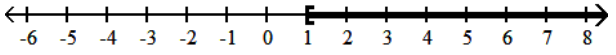
D) $(14, \infty)$



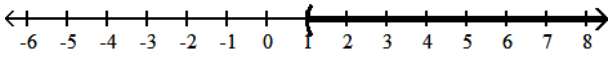
39) $-20x - 4 \leq -4(4x + 2)$ 39) _____



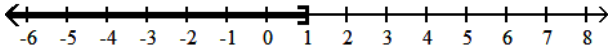
A) $[1, \infty)$



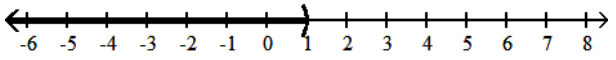
B) $(1, \infty)$



C) $(-\infty, 1]$



D) $(-\infty, 1)$



Use interval notation to represent all values of x satisfying the given conditions.

40) $y_1 = 8x - 2$, $y_2 = 7x + 4$, and $y_1 > y_2$. 40) _____

A) $(2, \infty)$ B) $(6, \infty)$ C) $[6, \infty)$ D) $(-\infty, 6]$

Solve the problem.

41) Claire has received scores of 85, 88, 87, and 80 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 82? 41) _____

A) 68 or greater B) 69 or greater C) 70 or greater D) 71 or greater

42) Using data from 1996-1998, the annual number of cars sold at a certain dealership can be modeled by the formula

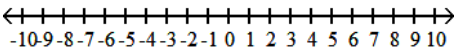
$y = 2x + 1,$

where y is the number of cars, in thousands, sold x years after 1996. According to this formula, in which years will the number of cars sold exceed 15 thousand? 42) _____

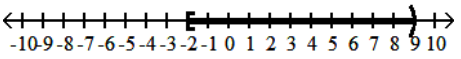
A) Years after 2001 B) Years after 2007 C) Years after 2005 D) Years after 2003

Solve the compound inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

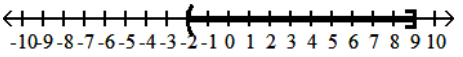
43) $-5 < x + 3 \leq 6$ 43) _____



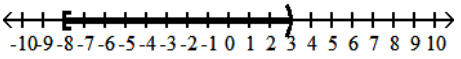
A) [-2, 9)



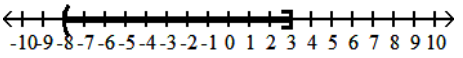
B) (-2, 9]



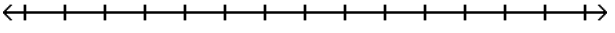
C) [-8, 3)



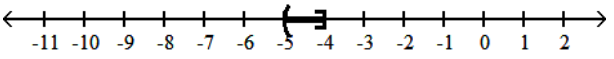
D) (-8, 3]



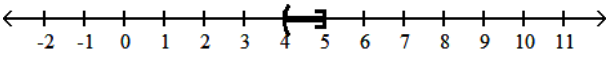
44) $-26 \leq -5x - 1 < -21$ 44) _____



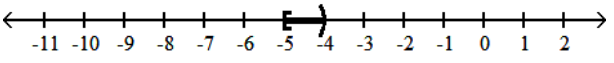
A) (-5, -4]



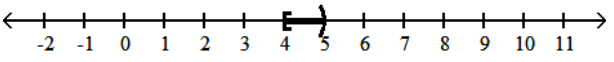
B) (4, 5]



C) [-5, -4)



D) [4, 5)



Solve the problem.

45) On the first four exams, your grades are 76, 78, 73, and 77. You are hoping to earn a C in the course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C? 45) _____

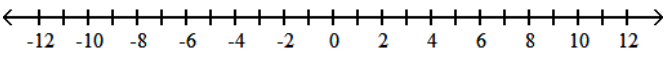
A) [46, 96) B) (46, 96] C) (36, 86] D) [36, 86)

46) On the first four exams, your grades are 76, 91, 60, and 77. There is still a final exam, and it counts as two grades. You are hoping to earn a C in the course. This will occur if the average of your six exam grades is greater than or equal to 70 and less than 80. What range of grades on the final exam will result in earning a C? 46) _____

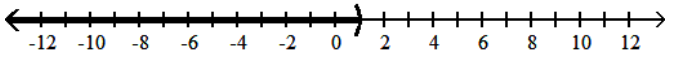
A) [58, 88) B) [46, 96] C) [58, 88] D) [46, 96)

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

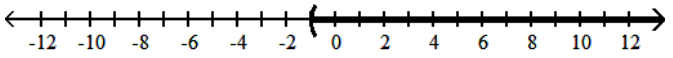
47) $|x - 1| < 0$ 47) _____



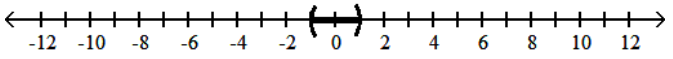
A) $(-\infty, 1)$



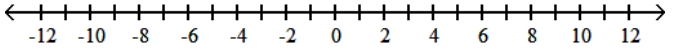
B) $(-1, \infty)$



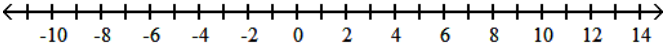
C) $(-1, 1)$



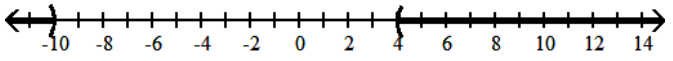
D) ∅



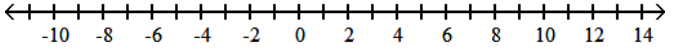
48) $|x + 3| < 7$ 48) _____



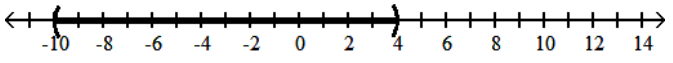
A) $(-\infty, -10) \cup (4, \infty)$



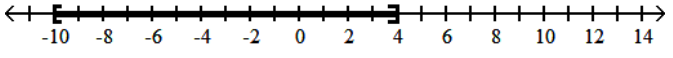
B) ∅



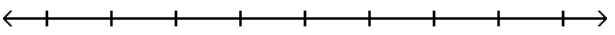
C) $(-10, 4)$



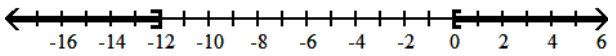
D) $[-10, 4]$



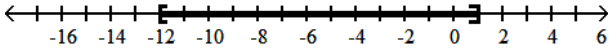
49) $|x + 6| - 5 \le 1$ 49) _____



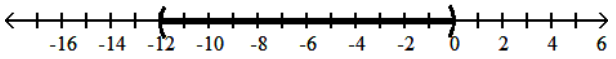
A) $(-\infty, -12] \cup [0, \infty)$



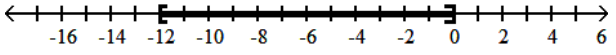
B) $[-12, 1]$



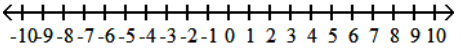
C) $(-12, 0)$



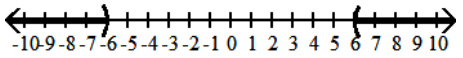
D) $[-12, 0]$



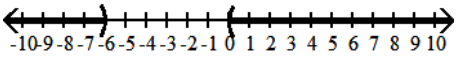
50) $\left|\frac{7y + 21}{3}\right| < 7$ 50) _____



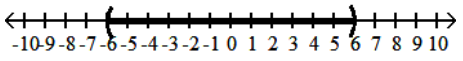
A) $(-\infty, -6) \cup (6, \infty)$



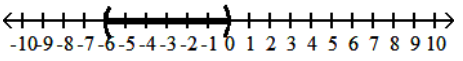
B) $(-\infty, -6) \cup (0, \infty)$



C) $(-6, 6)$



D) $(-6, 0)$



Evaluate the piecewise function at the given value of the independent variable.

51) $f(x) = \begin{cases} 4x + 3 & \text{if } x < 2 \\ 5x + 2 & \text{if } x \ge 2 \end{cases}$; $f(3)$ 51) _____

A) 18 B) 17 C) 14 D) 20

52) $h(x) = \begin{cases} \frac{x^2 - 7}{x + 6} & \text{if } x \ne -6 \\ x - 2 & \text{if } x = -6 \end{cases}$; $h(-6)$ 52) _____

A) -8 B) undefined C) 8 D) -4

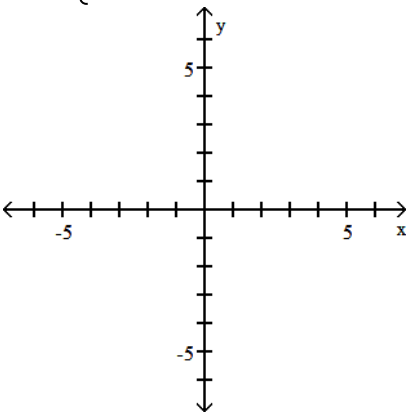
53) $f(x) = \begin{cases} x - 2 & \text{if } x > -1 \\ -(x - 2) & \text{if } x \le -1 \end{cases}$; $f(-2)$ 53) _____

A) -2 B) 17 C) 4 D) -4

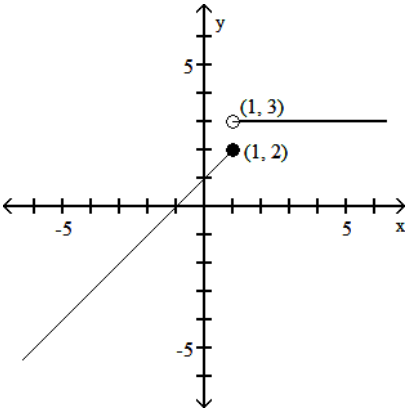
Graph the function.

54) $f(x) = \begin{cases} x + 1 & \text{if } x < 1 \\ 3 & \text{if } x \geq 1 \end{cases}$

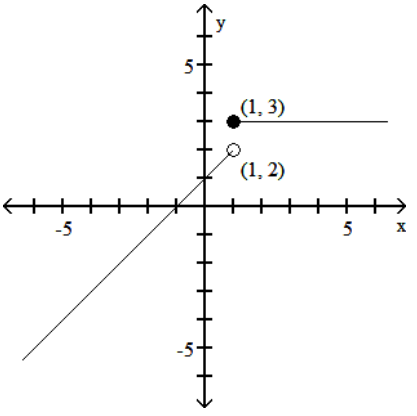
54) _____



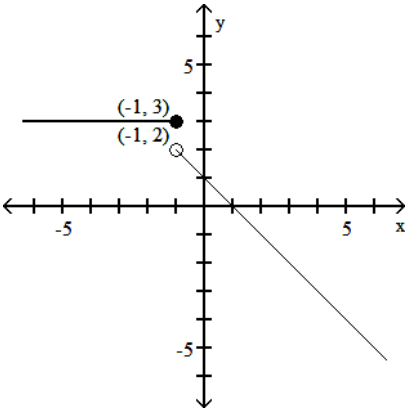
A)



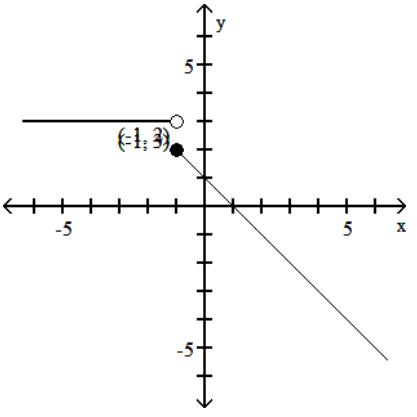
B)



C)

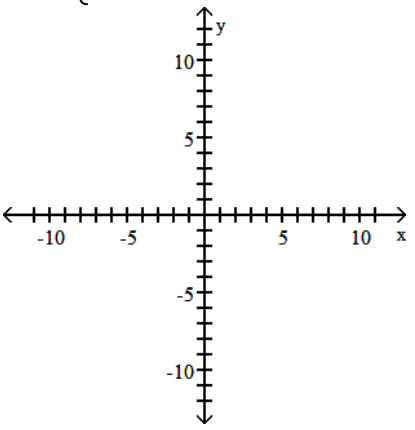


D)

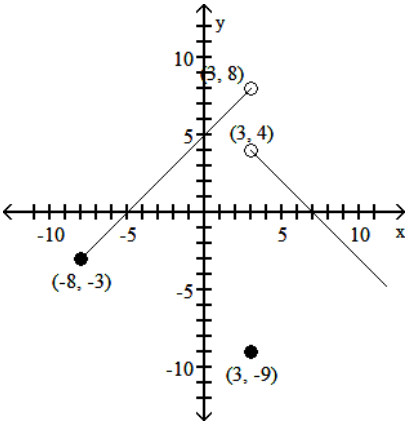


55) $f(x) = \begin{cases} x + 4 & \text{if } -8 \le x < 3 \\ -9 & \text{if } x = 3 \\ -x + 7 & \text{if } x > 3 \end{cases}$

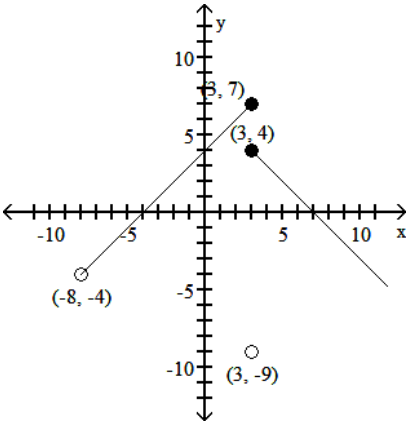
55) _____



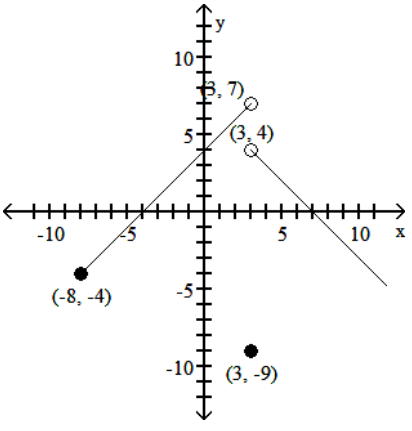
A)



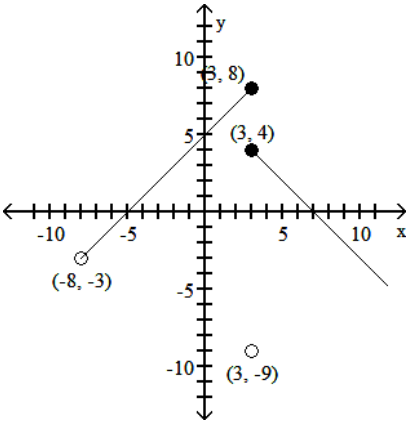
B)



C)

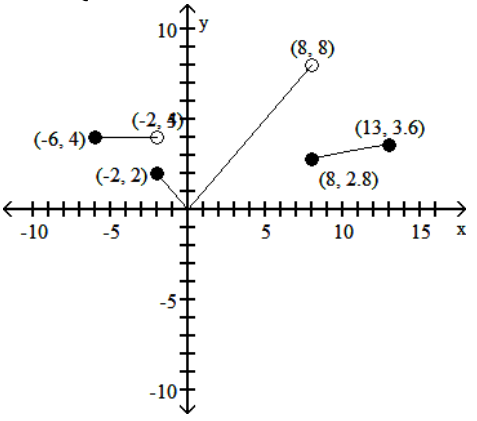


D)



Based on the graph, find the range of y = f(x).

56) $f(x) = \begin{cases} 4 & \text{if } -6 \le x < -2 \\ |x| & \text{if } -2 \le x < 8 \\ \sqrt{x} & \text{if } 8 \le x \le 13 \end{cases}$ 56) _____



A) $[0, \sqrt{13}]$ B) $[0, \infty)$ C) $[0, 8)$ D) $[0, 8]$

Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for the given function.

57) $f(x) = 3x - 7$ 57) _____

A) 0 B) $3 + \frac{6(x - 7)}{h}$ C) $3 + \frac{-14}{h}$ D) 3

58) $f(x) = 9$ 58) _____

A) $1 + \frac{18}{h}$ B) 0 C) 1 D) 9

59) $f(x) = 3x^2$ 59) _____

A) $\frac{3(2x^2 + 2xh + h^2)}{h}$ B) 3

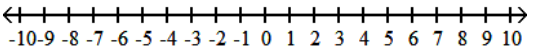
C) 3(2x+h) D) $\frac{6}{h} + x + 3h$

60) $f(x) = \frac{1}{5x}$ 60) _____

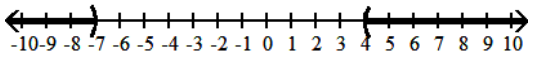
A) 0 B) $\frac{-1}{x(x + h)}$ C) $\frac{1}{5x}$ D) $\frac{-1}{5x(x + h)}$

Solve the polynomial inequality and graph the solution set on a number line. Express the solution set in interval notation.

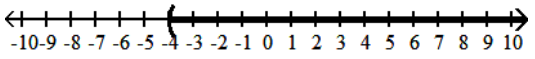
61) $(x - 7)(x + 4) > 0$ 61) _____



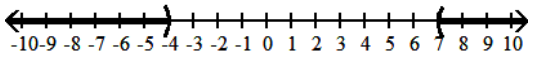
A) $(-\infty, -7) \cup (4, \infty)$



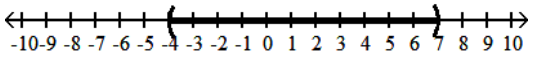
B) $(-4, \infty)$



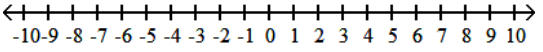
C) $(-\infty, -4) \cup (7, \infty)$



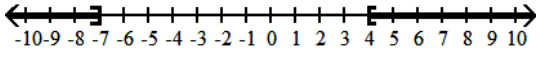
D) $(-4, 7)$



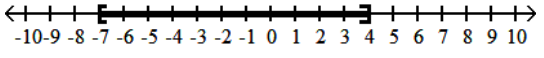
62) $(x + 7)(x - 4) \leq 0$ 62) _____



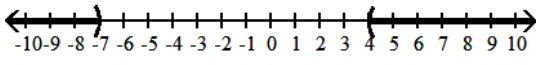
A) $(-\infty, -7] \cup [4, \infty)$



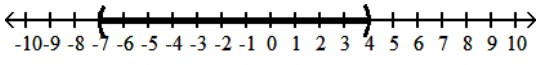
B) $[-7, 4]$



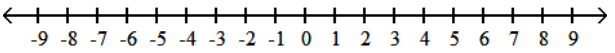
C) $(-\infty, -7) \cup (4, \infty)$



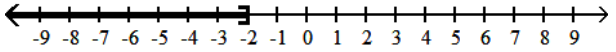
D) $(-7, 4)$



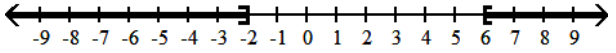
63) $x^2 - 4x - 12 \leq 0$ 63) _____



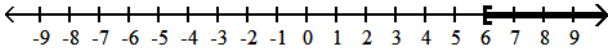
A) $(-\infty, -2]$



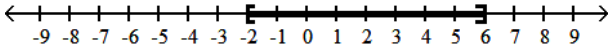
B) $(-\infty, -2] \cup [6, \infty)$



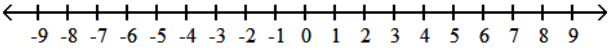
C) $[6, \infty)$



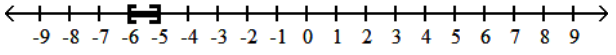
D) $[-2, 6]$



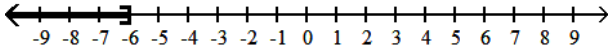
64) $x^2 + 11x + 30 \geq 0$ 64) _____



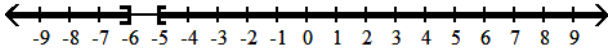
A) $[-6, -5]$



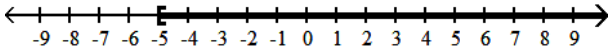
B) $(-\infty, -6]$



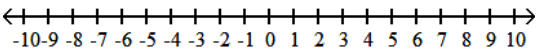
C) $(-\infty, -6] \cup [-5, \infty)$



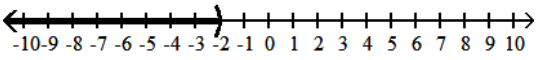
D) $[-5, \infty)$



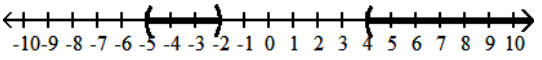
65) $(x + 5)(x + 2)(x - 4) > 0$ 65) _____



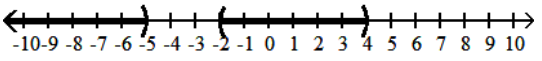
A) $(-\infty, -2)$



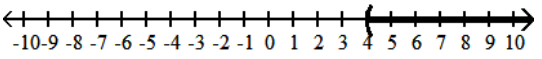
B) $(-5, -2) \cup (4, \infty)$



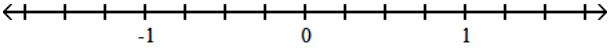
C) $(-\infty, -5) \cup (-2, 4)$



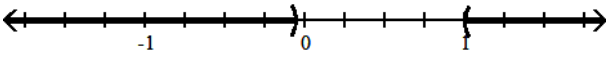
D) $(4, \infty)$



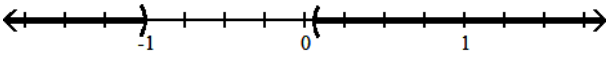
66) $18x^2 < 17x + 1$ 66) _____



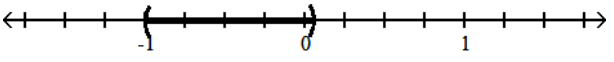
A) $\left(-\infty, -\frac{1}{18}\right) \cup (1, \infty)$



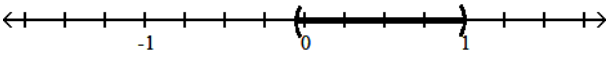
B) $(-\infty, -1) \cup \left(\frac{1}{18}, \infty\right)$



C) $\left(-1, \frac{1}{18}\right)$

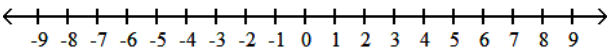


D) $\left(-\frac{1}{18}, 1\right)$

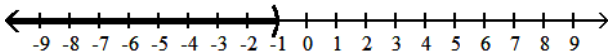


Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

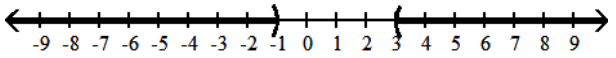
67) $\frac{x - 3}{x + 1} < 0$ 67) _____



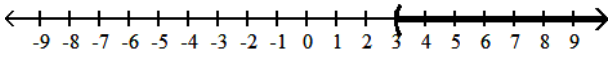
A) $(-\infty, -1)$



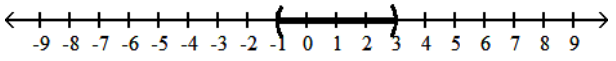
B) $(-\infty, -1)$ or $(3, \infty)$



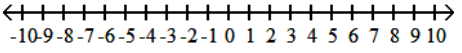
C) $(3, \infty)$



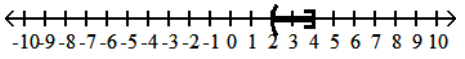
D) $(-1, 3)$



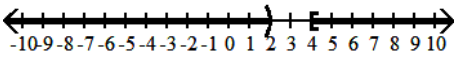
68) $\frac{-x + 4}{x - 2} \geq 0$ 68) _____



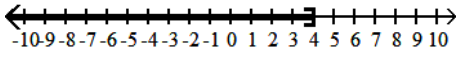
A) $(2, 4]$



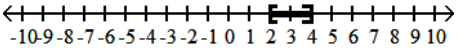
B) $(-\infty, 2)$ or $[4, \infty)$



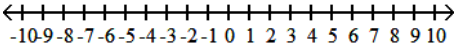
C) $(-\infty, 4]$



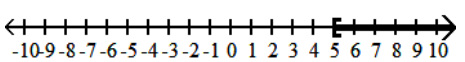
D) $[2, 4]$



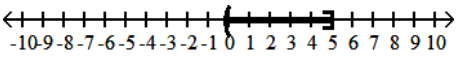
69) $\frac{15 - 3x}{6x + 1} \leq 0$ 69) _____



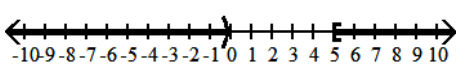
A) $[5, \infty)$



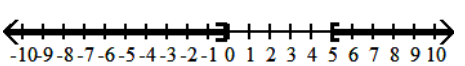
B) $\left(-\frac{1}{6}, 5\right]$



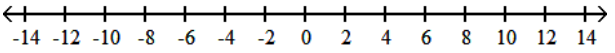
C) $\left(-\infty, -\frac{1}{6}\right]$ or $[5, \infty)$



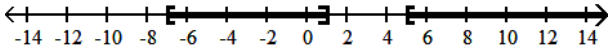
D) $\left(-\infty, -\frac{1}{6}\right]$ or $[5, \infty)$



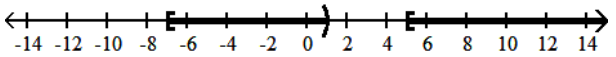
70) $\frac{(x + 7)(x - 5)}{x - 1} \geq 0$ 70) _____



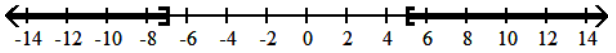
A) $[-7, 1] \cup [5, \infty)$



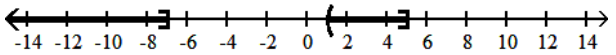
B) $[-7, 1) \cup [5, \infty)$



C) $(-\infty, -7] \cup [5, \infty)$

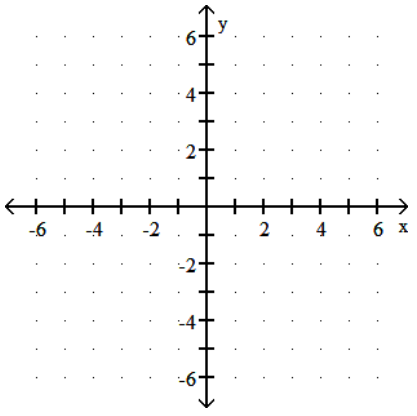


D) $(-\infty, -7] \cup (1, 5]$

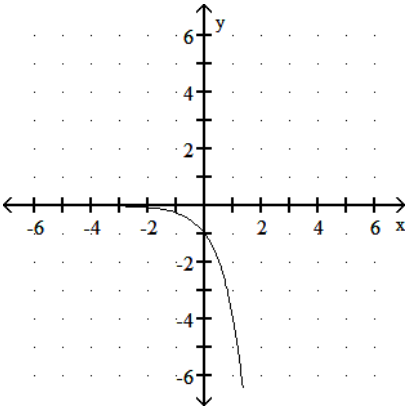


Graph the function by making a table of coordinates.

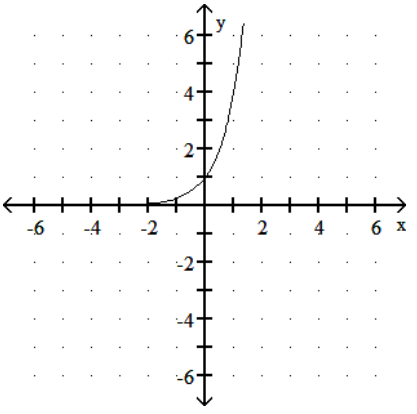
71) $f(x) = 4^x$ 71) _____



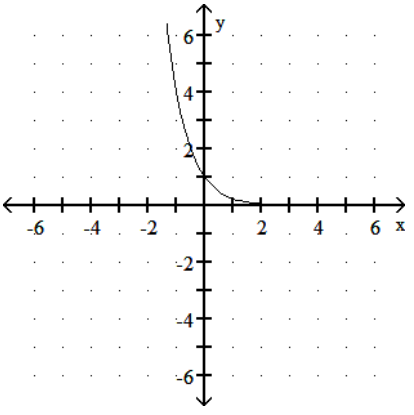
A)



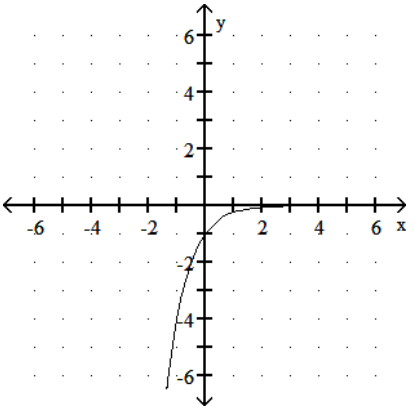
B)



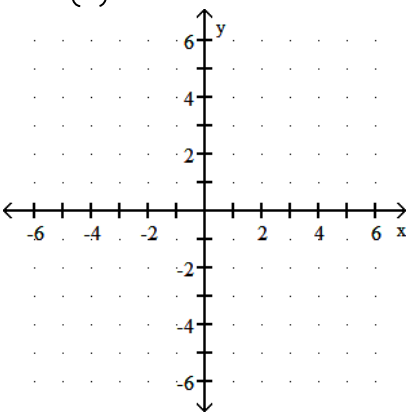
C)



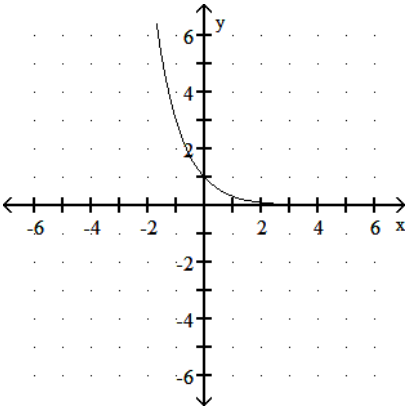
D)



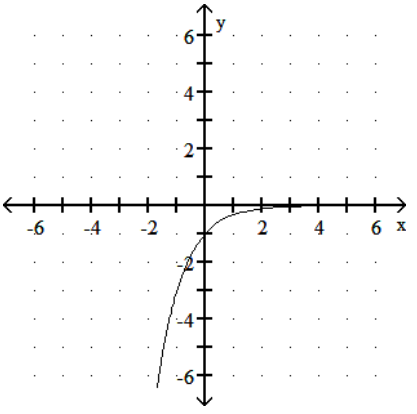
72) $f(x) = \left(\frac{1}{3}\right)^x$ 72) _____



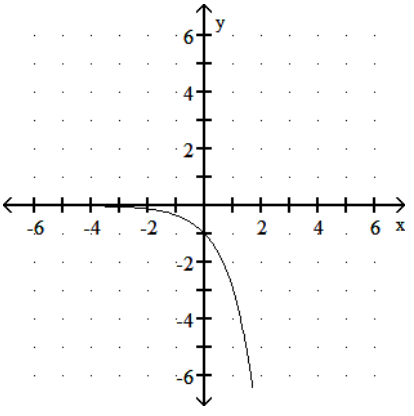
A)



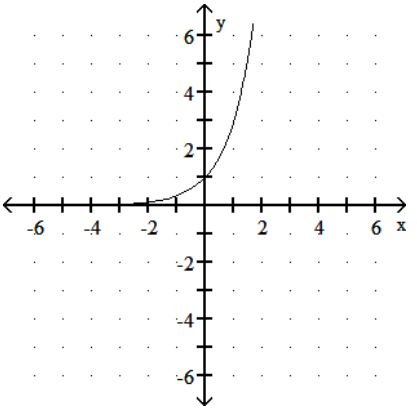
B)



C)



D)



Write the equation in its equivalent exponential form.

73) $\log_5 25 = 2$ 73) _____

A) $2^5 = 25$ B) $5^{25} = 2$ C) $25^2 = 5$ D) $5^2 = 25$

74) $\log_b 64 = 3$ 74) _____

A) $64^3 = b$ B) $64^b = 3$ C) $3^b = 64$ D) $b^3 = 64$

Write the equation in its equivalent logarithmic form.

75) $6^3 = 216$ 75) _____

A) $\log_6 216 = 3$ B) $\log_6 3 = 216$

C) $\log_{216} 6 = 3$ D) $\log_3 216 = 6$

76) $7^3 = x$ 76) _____

A) $\log_x 7 = 3$ B) $\log_7 x = 3$ C) $\log_7 3 = x$ D) $\log_3 x = 7$

Evaluate the expression without using a calculator.

77) $\log_5 125$ 77) _____

A) 1 B) 15 C) 3 D) $\frac{1}{3}$

78) $\log_{10} 10{,}000$ 78) _____

A) $\frac{1}{10000}$ B) 40 C) 4 D) -4

79) $\log_{11} \sqrt{11}$ 79) _____

A) 11 B) 1 C) $\frac{1}{11}$ D) $\frac{1}{2}$

80) $\log_3 \frac{1}{\sqrt{3}}$ 80) _____

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

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

81) 30° 81) _____

A) $\frac{\pi}{6}$ radians B) $\frac{\pi}{5}$ radians C) $\frac{\pi}{7}$ radians D) $\frac{\pi}{8}$ radians

82) - 150° 82) _____

A) $-\frac{5\pi}{6}$ radians B) $-\frac{2}{3}\pi$ radians C) $-\frac{6\pi}{7}$ radians D) $-\frac{4\pi}{5}$ radians

Convert the angle in radians to degrees.

83) $-\frac{\pi}{4}$ 83) _____

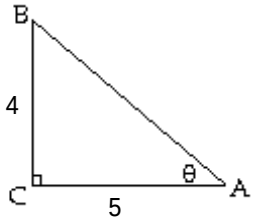
A) -45° B) $-45\pi°$ C) $-\left(\frac{\pi}{4}\right)°$ D) -1°

84) $\frac{19}{6}\pi$ 84) _____

A) 10° B) 570° C) $1140\pi°$ D) 285°

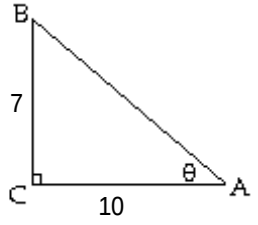
Use the Pythagorean Theorem to find the length of the missing side.Then find the indicated trigonometric function of the given angle. Give an exact answer with a rational denominator.

85) Find sin θ. 85) _____



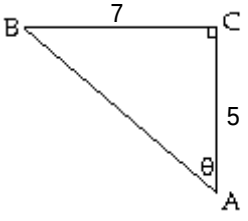
A) $\frac{\sqrt{41}}{4}$ B) $\frac{\sqrt{41}}{5}$ C) $\frac{4\sqrt{41}}{41}$ D) $\frac{5\sqrt{41}}{41}$

86) Find cos θ. 86) _____



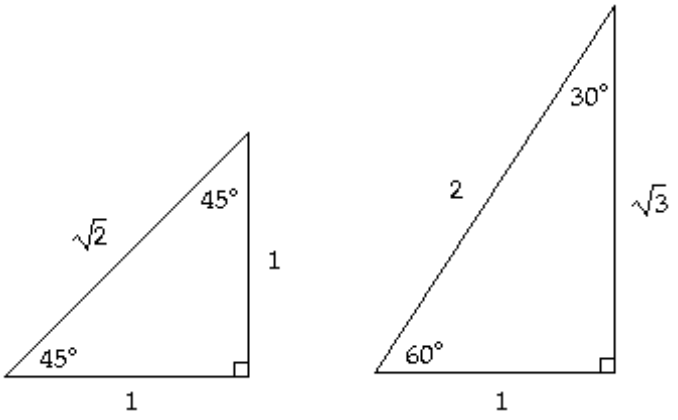
A) $\frac{\sqrt{149}}{7}$ B) $\frac{\sqrt{149}}{10}$ C) $\frac{10\sqrt{149}}{149}$ D) $\frac{7\sqrt{149}}{149}$

87) Find tan θ. 87) _____



A) $\frac{\sqrt{74}}{7}$ B) $\frac{\sqrt{74}}{5}$ C) $\frac{7}{5}$ D) $\frac{5}{7}$

Use the given triangles to evaluate the expression. Rationalize all denominators.



88) tan 30° 88) _____

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

89) cot $\frac{\pi}{6}$ 89) _____

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

90) tan $\frac{\pi}{3}$ 90) _____

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

91) tan 45° - sin 60° 91) _____

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

92) cot $\frac{\pi}{3}$ - cos $\frac{\pi}{6}$ 92) _____

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

θ is an acute angle and sin θ and cos θ are given. Use identities to find the indicated value.

93) sin $\theta = \frac{5}{7}$, cos $\theta = \frac{2\sqrt{6}}{7}$. Find tan θ. 93) _____

A) $\frac{5\sqrt{6}}{5}$ B) $\frac{7}{5}$ C) $\frac{5\sqrt{6}}{12}$ D) $\frac{7\sqrt{6}}{12}$

94) sin $\theta = -\frac{\sqrt{11}}{6}$, cos $\theta = \frac{5}{6}$. Find cot θ. 94) _____

A) $\frac{-6\sqrt{11}}{11}$ B) $\frac{6}{5}$ C) $\frac{\sqrt{11}}{5}$ D) $\frac{-5\sqrt{11}}{11}$

θ is an acute angle and $\sin\theta$ is given. Use the Pythagorean identity $\sin^2\theta + \cos^2\theta = 1$ to find $\cos\theta$.

95) $\sin\theta = \frac{1}{4}$ 95) _____

A) $\frac{\sqrt{15}}{4}$ B) 4 C) $\frac{4\sqrt{15}}{15}$ D) $\frac{\sqrt{15}}{15}$

Complete the identity.

96) $\sec x - \frac{1}{\sec x} = ?$ 96) _____

A) $1 + \cot x$ B) $-2\tan^2 x$ C) $\sin x \tan x$ D) $\sec x \csc x$

97) $\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = ?$ 97) _____

A) $1 + \cot x$ B) $\sin x \tan x$ C) $-2\tan^2 x$ D) $\sec x \csc x$

98) $\sin^2 x + \sin^2 x \cot^2 x = ?$ 98) _____

A) $\sin^2 x + 1$ B) $\cot^2 x + 1$ C) $\cot^2 x - 1$ D) 1

Find the exact value by using a sum or difference identity.

99) $\cos(45° + 60°)$ 99) _____

A) $-\frac{\sqrt{2}(\sqrt{3} - 1)}{4}$ B) $\frac{\sqrt{2}(\sqrt{3} + 1)}{4}$ C) $\frac{\sqrt{2}(\sqrt{3} - 1)}{4}$ D) $-\frac{\sqrt{2}(\sqrt{3} + 1)}{4}$

Find the exact value of the expression.

100) $\cos\frac{7\pi}{18}\sin\frac{2\pi}{9} - \cos\frac{2\pi}{9}\sin\frac{7\pi}{18}$ 100) _____

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) 1 D) $\frac{1}{4}$