



UNITED ARAB EMIRATES UNIVERSITY

UNIVERSITY FOUNDATION PROGRAM - MATH PROGRAM

ALGEBRA - COLLEGE ALGEBRA - TRIGONOMETRY

PRACTICE QUESTIONS

1. What is $2x - 1$ if $-4x + 8 = -6 + 3x$?

A. 2

B. -3

C. 3

D. 4

E. 5

2. What is $-2x$ if $\frac{2x - 4}{2} - 3 = \frac{-x + 3}{3}$?

A. -8

B. -9

C. $4\frac{1}{2}$

D. $5\frac{1}{2}$

E. 9

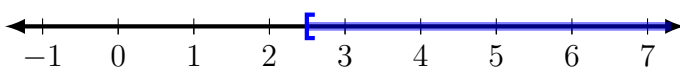
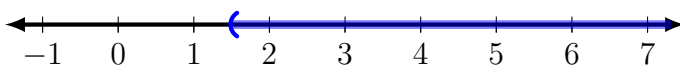
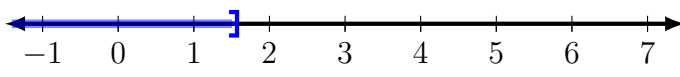
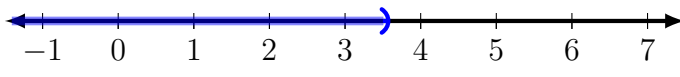
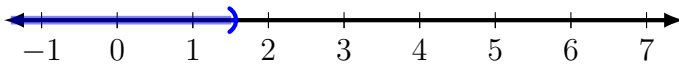
3. The solution to the equation $-0.2(x - 3) - x - 0.9 = 0.4x + 0.5$ is equal to

- A. 0.5
- B. 0.25
- C. -5
- D. 5
- E. -0.5

4. Solve for m in the equation $\frac{-4t + m}{3} = 4m$.

- A. $-4t$
- B. $4t$
- C. $-\frac{4t}{11}$
- D. $-\frac{11}{4t}$
- E. $11 + 4t$

5. Which of the following graphs represents the solution set to the inequality $-4x + 2 < 2x - 7$?

- A. 
- B. 
- C. 
- D. 
- E. 

6. Which of the following intervals represents the solution set to the inequality $-2 < \frac{x}{2} + 2 \leq 3$?

A. $(-8, 2)$

B. $(-8, 2]$

C. $(-4, 1]$

D. $[-8, 2)$

E. $[-6, 4]$

7. The sum of $3x^3 - 2x^2 + 3x - 8$ and $-5x^3 - 4x^2 - x - 9$ is

A. $8x^3 - 6x^2 + 2x - 17$

B. $-2x^3 + 6x^2 + 2x - 17$

C. $-2x^3 - 6x^2 + 2x - 1$

D. $-2x^3 - 6x^2 + 2x - 17$

E. $-12x^5 + 2x - 17$

8. $(-6x^2 + 3x - 9) - (x^2 - 3x + 1) = ?$

A. $-5x^2 - 10$

B. $-7x^2 + 6x - 8$

C. $7x^2 + 6x - 10$

D. $-42x^3 - 10$

E. $-7x^2 + 6x - 10$

9. $(2b - 2)^2 - b(2b + 2) = ?$

A. $6b^2 + 10b + 4$

B. $4b^2 - 8b + 4$

C. $2b^2 - 10b + 4$

D. $4b^2 + 4$

E. $2b^2 - 12b + 4$

10. Solve for x in the equation $-2(-x - 6) + 2x = -4(x - 2) + 6$.

A. $\frac{1}{4}$

B. 0

C. 4

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

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

11. What is $x + \frac{11}{2}$ if x is a solution of the equation $x + 3 = -\frac{2}{5}(2 - x) + 2$?

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

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

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

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

E. -3

12. What is the solution of the equation $3\frac{1}{2} - 4x = \frac{1}{2}$?

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

B. $1\frac{1}{3}$

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

D. -1

E. 1

13. What is the solution set of the inequality $-5 \leq 7 - \frac{2}{3}x < -1$?

A. $[12, 18)$

B. $(-6, -3]$

C. $[-6, -3)$

D. $\left(\frac{2}{3}, 18\right]$

E. $(12, 18]$

14. What is the solution set of the inequality $-(3 - 2x) > 4x + 4$?

A. $x > -3\frac{1}{2}$

B. $x < -3\frac{1}{2}$

C. $x < -\frac{7}{6}$

D. $x > -\frac{7}{6}$

E. $x > 3\frac{1}{2}$

15. Find the value of k so that $(x + 2)(x - 3) + 2x - 1 = x^2 - 2kx - 7$.

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

B. $-\frac{3}{2}$

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

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

E. -1

16. $(2 - x^2) - 3(x^2 - 4x) + (x - 1)(2 - x) = ?$

A. $-5x^2 + 15x$

B. $-5x^2 - 9x$

C. $-3x^2 - 3x$

D. $-5x^2 + 15x + 4$

E. $-5x^2 + 15x - 4$

17. The equation of the line passing through the points $(-5, -5)$ and $(1, 3)$ is

A. $4x + 3y = 5$

B. $-2x + 2y = 5$

C. $2x + y = 5$

D. $-4x + 3y = 5$

E. $-4x + 3y = -5$

18. Find the value of k so that the lines with equations $y = \frac{1}{2}x - 3$ and $\frac{3}{k}x - y = 1$ are perpendicular.

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

B. $-\frac{2}{3}$

C. $-\frac{3}{2}$

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

E. -1

19. Which of the following lines are parallel?

A. $-x + y = 2$ and $-x - y = 2$

B. $3x = y$ and $x = -2y + 1$

C. $x = 3$ and $y = -2$

D. $y = 4 - 5x$ and $x = 4 - 5y$

E. $3x - y = 5$ and $-6x = -2y + 1$

20. Find the distance between the x - and y -intercepts of the line with equation $-2x + 5y = -10$.

A. $\sqrt{21}$

B. $\sqrt{29}$

C. $\sqrt{3}$

D. 3

E. 29

21. Solve the equation $ax - b = c(1 - x)$ for x .

A. $x = \frac{c - b}{ac}$

B. $x = \frac{bc}{a}$

C. $x = \frac{b + c}{a + c}$

D. $x = \frac{b + c}{a}$

E. $x = \frac{a + c}{b + c}$

22. What are the roots of the equation $(2x - 1)(x + 1) = 14$?

A. $-3, \frac{5}{2}$

B. $-1, \frac{1}{2}$

C. $-\frac{5}{2}, 3$

D. $-\frac{1}{2}, 1$

E. $-3, -\frac{5}{2}$

23. For all $x \neq -3$; $\frac{2x - 3}{x + 3} - 1 = ?$

A. $\frac{x}{x + 3}$

B. $\frac{3x - 6}{x + 3}$

C. $x - 6$

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

E. $\frac{x - 6}{x + 3}$

24. For all $x \neq 2$; $\frac{3x^2 - 11x + 10}{5x - 10} = ?$

A. $\frac{3x + 5}{5}$

B. $\frac{x}{x - 2}$

C. $\frac{3x - 5}{5}$

D. $\frac{-x}{x - 2}$

E. $\frac{3x + 11}{5}$

25. For all $x \neq 2$ and $x \neq -5$; $\frac{\frac{2x + 10}{x + 5}}{\frac{2x - 4}{x + 5}} = ?$

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

B. $-\frac{5}{2}$

C. $\frac{x + 5}{2}$

D. $\frac{-40}{(x + 5)^2}$

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

26. A train leaves a train station going east at 72 miles per hour. At the same time, another train leaves the same station going west at 60 miles per hour. How long would it take the two trains to be 792 miles apart?

A. 6 hr

B. 3 hr

C. 6.5 hr

D. 12 hr

E. 15 hr

27. For what values of x is $\sqrt{3 - 2x}$ defined?

A. $x > 5\frac{1}{2}$

B. $x > 3\frac{1}{2}$

C. $x \geq 2\frac{1}{2}$

D. $x \leq 1\frac{1}{2}$

E. $x > 1\frac{1}{2}$

28. What is the domain of $f(x) = \frac{-3}{\sqrt{16 - x^2}}$?

A. $[-4, 4]$

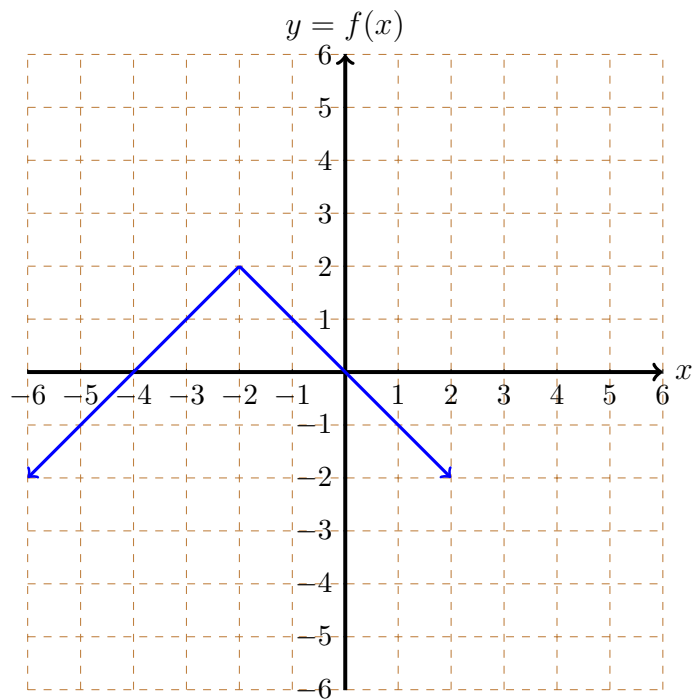
B. $(-4, 4)$

C. $(-\infty, -4) \cup (4, +\infty)$

D. $(-\infty, -4] \cup [4, +\infty)$

E. $(-\infty, +\infty)$

29. What is the range of function f whose graph is shown below?



- A. $[-6, 2]$
- B. $(-\infty, 0)$
- C. $(-\infty, 2]$
- D. $[2, +\infty)$
- E. $(-\infty, +\infty)$

30. If $h(x) = \sqrt{-x+2} + x^2$, what is $h(-2)$?

- A. not a real number
- B. 6
- C. 4
- D. -4
- E. 2

31. If $h(x) = (-x + 1)^2 - 5$ and $g(x) = -x - 2$, then $(h \circ g)(x) = ?$

A. $-x^3 + 8x + 8$

B. $-x^2 + 2x + 2$

C. $-x^2$

D. $-x^2 + 6x + 4$

E. $x^2 + 6x + 4$

32. If $f(x) = -x^2 - 9$ and $g(x) = x - 4$, then $(f \circ g)(2) = ?$

A. -17

B. -13

C. 26

D. 13

E. 17

33. If $f(x) = \sqrt{-2x - 4}$ and $g(x) = 3x^2 + 4x - 4$, then the domain of $f + g$ is

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

B. $[-2, +\infty)$

C. $(-\infty, +\infty)$

D. $(-\infty, -2]$

E. $(-\infty, -2)$

34. If $f(x) = \frac{x+3}{x-4}$, what is the range of f^{-1} ?

A. $(-\infty, 4) \cup (4, +\infty)$

B. $(-\infty, +\infty)$

C. $(-\infty, -3) \cup (-3, +\infty)$

D. $(-\infty, 4)$

E. $(-\infty, -3)$

35. For what value of x does the function $f(x) = -x^2 + 3x - 5$ attain its maximum ?

A. 5

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

C. 3

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

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

36. If $f(x) = \sqrt{x-1}$, what is the value of $f^{-1}(2)$?

A. 5

B. -1

C. 1

D. $\sqrt{5}$

E. 2

37. If $f(x) = \frac{6-x}{-2x+1}$, then $f^{-1}(x) = ?$

A. $\frac{-2x+1}{6-x}$

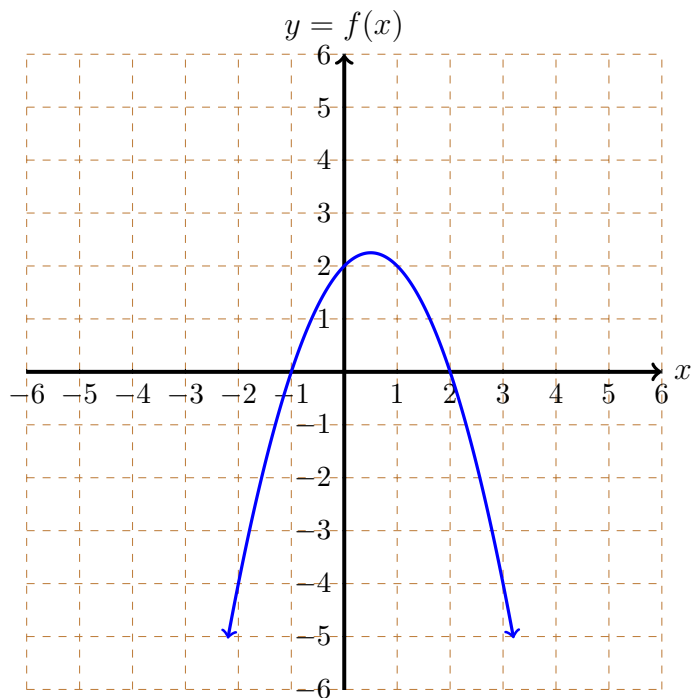
B. $\frac{6-x}{-2x+1}$

C. $\frac{x+3}{2x+1}$

D. $\frac{-6+x}{-2x+1}$

E. $\frac{6-x}{2x-1}$

38. Which of the following is an appropriate expression for function f whose graph is given below?



A. $f(x) = x + 2$

B. $f(x) = -x^2 - 2$

C. $f(x) = -x^2 + 3$

D. $f(x) = -x^2 + 2$

E. $f(x) = -(x+1)(x-2)$

39. Which of the following is the solution set to the logarithmic equation $\log_4(x+5)+\log_4(x-1) = 2$?

A. $\{-7, 3\}$

B. $\{4\}$

C. $\{-7\}$

D. $\{3\}$

E. $\{-3, 7\}$

40. If $27^{4x+5} = \left(\frac{1}{9}\right)^{x-3}$, then $x = ?$

A. $-\frac{21}{14}$

B. $-\frac{9}{14}$

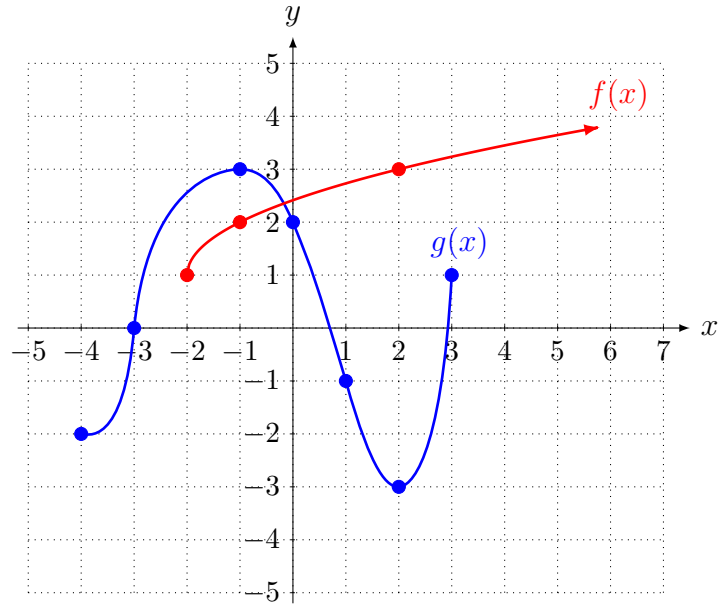
C. $-\frac{21}{10}$

D. $\frac{21}{24}$

E. $-\frac{9}{10}$

41. The graphs of $f(x)$ and $g(x)$ are given below. What is the value of $(f \circ g)(0)$?

- A. $-\frac{1}{2}$
- B. 0
- C. 3
- D. $-\frac{2}{3}$
- E. -3



42. If $\log_5(4x) = -2$, then what is the value of x ?

- A. 100
- B. $\frac{1}{100}$
- C. $-\frac{1}{50}$
- D. $\frac{1}{50}$
- E. $\frac{1}{25}$

43. If $2\log_4(x) = \log_4(64)$, then $x =$?

- A. 16
- B. 62
- C. 32
- D. $\sqrt{8}$
- E. 8

44. Which of the following is the vertex of the graph of the quadratic function $y = -2x^2 - 8x + 1$?

A. $(-2, -23)$

B. $(-2, 9)$

C. $(-2, 25)$

D. $(2, -23)$

E. $(2, 9)$

45. If $5^{3x+2} = 12$, then $x \approx$?

A. -0.261

B. 2.648

C. -0.340

D. -0.152

E. -0.523

46. For all $x > 0$ and $y > 0$, $\log_7(x^4\sqrt{y}) =$?

A. $4\log_7(x) + \frac{1}{2}\log_7(y)$

B. $4\log_7(x) - \frac{1}{2}\log_7(y)$

C. $\log_4(x) + \log_7(x) - \log_7\left(\frac{1}{2}\right) - \log_7(x)$

D. $\log_4(x) + \log_7(x) + \log_7\left(\frac{1}{2}\right) - \log_7(x)$

E. $\log_4(x) + \log_7(x) - \log_7\left(\frac{1}{2}\right) + \log_7(x)$

47. If $i = \sqrt{-1}$ and $x + yi = \frac{5 + 3i}{2 - i}$, which of the following is the value of the real number y ?

A. $-\frac{11}{5}i$

B. $\frac{11}{5}i$

C. $-\frac{11}{5}$

D. $\frac{11}{5}$

E. $\frac{7}{5}$

48. If $f(x) = 2x^2 - px - 6$ and $f(2) = -14$, then $p = ?$

A. -8

B. 14

C. 0

D. 8

E. 6

49. If $i = \sqrt{-1}$, then $i^3 + i^5 + i^7 + i^9 = ?$

A. $-2i$

B. $2i$

C. 0

D. 1

E. $-4i$

50. If $i = \sqrt{-1}$, then $(5 + 2i)^2 = ?$

A. $21 + 20i$

B. $21 - 20i$

C. $-21 + 20i$

D. $29 - 20i$

E. $29 + 20i$

51. If $g(x) = 3x + 1$ and $(f \circ g)(x) = \frac{3}{\sqrt{3x + 1}}$, then $f(x) = ?$

A. $\frac{3}{\sqrt{x}}$

B. $\sqrt{3x + 1}$

C. 3

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

E. $\frac{1}{\sqrt{3x + 1}}$

52. If $10! = 7! \cdot m$, then $m = ?$

A. $\frac{720}{7}$

B. 3

C. 720

D. $\frac{10}{7}$

E. $\frac{1}{720}$

53. If $\frac{3}{4}, x, \frac{1}{12}, \dots$ is an arithmetic sequence, then $x =$?

A. $-\frac{5}{12}$

B. $-\frac{12}{5}$

C. $\frac{13}{12}$

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

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

54. Which of the following is not a one-to-one function?

A. $(x - 1)^2 - 7, x \geq 1$

B. $(x - 2)^3 + 4$

C. $x + 6$

D. $x^2 + 5$

E. $-\sqrt{x + 3}$

55. What is the sum of the first 18 terms of the arithmetic sequence $\frac{1}{4}, 1, \frac{7}{4}, \dots$?

A. $\frac{477}{4}$

B. 230

C. $\frac{953}{4}$

D. $-\frac{451}{4}$

E. $-\frac{4}{477}$

56. What is the tenth term of the geometric sequence $4, -12, 36, \dots$?

A. -120

B. $236,196$

C. $-78,732$

D. $-59,045$

E. $78,732$

57. If the domain of the function f is $[-2, 5)$, what is the domain of the function g defined by $g(x) = f(x + 3) - 6$?

A. $[-5, 2)$

B. $[1, 2]$

C. $[1, 8)$

D. $[2, -5)$

E. $(8, -5]$

58. If $A = \begin{bmatrix} 3 & -4 \\ 8 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -8 & -4 \\ 3 & 5 \end{bmatrix}$, then $-2A + 3B = ?$

A. $\begin{bmatrix} -13 & 18 \\ -4 & 7 \end{bmatrix}$

B. $\begin{bmatrix} 25 & -4 \\ 18 & -13 \end{bmatrix}$

C. $\begin{bmatrix} -7 & -20 \\ 30 & 7 \end{bmatrix}$

D. $\begin{bmatrix} 18 & 20 \\ -25 & -13 \end{bmatrix}$

E. $\begin{bmatrix} -30 & -4 \\ -7 & 17 \end{bmatrix}$

59. If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$, which of the following is equivalent to $\begin{vmatrix} 9 & -7 \\ 2 & -1 \end{vmatrix} - \begin{vmatrix} 8 & \sqrt{7} \\ -\sqrt{7} & 6 \end{vmatrix}$?

A. 102

B. -120

C. -14

D. -50

E. -12

60. If $i = \sqrt{-1}$, then $i^{18} = ?$

A. -1

B. i

C. 1

D. $-i$

E. 0

61. If $n \geq 1$, which of the following expressions is equivalent to $\frac{n!(n+6)!}{(n+7)!(n-1)!}$?

A. $\frac{n}{n+7}$

B. $\frac{n}{n+6}$

C. $\frac{n^2 + 6n}{n^2 + 6n - 7}$

D. $\frac{6n}{7n - 7}$

E. $\frac{n+7}{n}$

62. What is the 205th term of the arithmetic sequence 15, 8, 1, -6, ...?

- A. 1420
- B. -1413
- C. 1413
- D. -1420
- E. 1443

63. What is the ninth term of the geometric sequence whose first term is 6 and whose fourth term is $\frac{16}{9}$?

- A. $\frac{19683}{128}$
- B. $\frac{512}{2187}$
- C. $\frac{2187}{512}$
- D. $\frac{128}{729}$
- E. $\frac{243}{64}$

64. What is the degree measure of $\theta = -\frac{3\pi}{20}$?

- A. -27
- B. -16
- C. 0
- D. -4
- E. 2

65. What is the radian measure of $\theta = 216^\circ$?

A. 108π

B. $\frac{5\pi}{6}$

C. $\frac{6\pi}{5}$

D. $\frac{8\pi}{9}$

E. $\frac{4\pi}{9}$

66. Given $\sin \alpha = \frac{\sqrt{10}}{10}$, find the exact value of $\sec \alpha$.

A. 3

B. $\frac{\sqrt{110}}{10}$

C. $\frac{3\sqrt{10}}{10}$

D. $\frac{10}{3}$

E. $\frac{\sqrt{10}}{3}$

67. Find the exact value of $\frac{1}{\sec^2 32^\circ} + \frac{1}{\csc^2 32^\circ}$.

A. 2

B. 1

C. $\frac{1}{16}$

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

E. 0

68. Find the exact value of $\cos \frac{\pi}{3} - \cot \frac{\pi}{4}$.

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

B. $-\frac{3}{2}$

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

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

E. 0

69. Find the exact value of $\csc(-420^\circ)$.

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

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

C. 2

D. -2

E. $2\sqrt{3}$

70. An observer standing 50 meters away from a building notices a flagpole on the top of the building. If the angle of elevation to the base of the flagpole is 46.2° and the angle of elevation to the top of the flagpole is 50.1° , what is the height of the flagpole?

A. 2.3 m

B. 2.5 m

C. 59.8 m

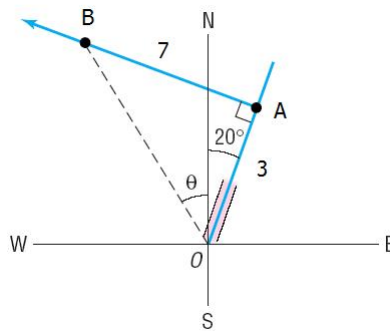
D. 7.7 m

E. 3.4 m

71. Find the reference angle of 600° .

- A. 25°
- B. 15°
- C. 60°
- D. 30°
- E. 45°

72. An aircraft takes off from an airport which has a bearing of NorthEast 20° . After flying 3 miles, the pilot turns the plane 90° heading NorthWest. After the plane goes 7 miles in this direction, what is the bearing of the aircraft from the due North of the airport tower? (that is, what is the angle θ)? See graph below.



- A. 66.8°
- B. 5.4°
- C. 44.6°
- D. 23.2°
- E. 46.8°

73. If $\cos \theta = -\frac{2}{3}$ and $\frac{\pi}{2} < \theta < \pi$, find the exact value of $\cot \theta$.

A. $\frac{3\sqrt{5}}{5}$

B. $-\frac{2\sqrt{5}}{5}$

C. $-\frac{\sqrt{5}}{2}$

D. $\frac{2\sqrt{5}}{5}$

E. $-\frac{3}{2}$

74. If $\tan \theta = -4$ and $\sin \theta < 0$, find the exact value of $\cos \theta$.

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

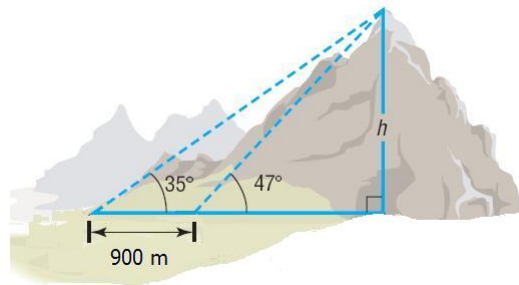
B. $\sqrt{17}$

C. $\frac{\sqrt{17}}{17}$

D. $-\frac{4\sqrt{17}}{17}$

E. $-\frac{3}{2}$

75. From a distance, an observer estimated that the angle of elevation to the top of the mountain is 35° . The observer moved 900 meters closer to the mountain and estimated the angle of elevation to be 47° . How tall is the mountain? See figure below.



- A. 2595 m
- B. 1816 m
- C. 381 m
- D. 6404 m
- E. 630 m
76. If $\left(-\frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5}\right)$ is a point on the unit circle corresponding to angle t , find $\cot t$.
- A. $-\frac{1}{2}$
- B. $-\sqrt{5}$
- C. $-\frac{\sqrt{5}}{5}$
- D. $-\frac{2}{5}$
- E. -2

77. If $(-5, 11)$ is a point on the terminal side of an angle θ in standard position, find the exact value of $\sec \theta$.

A. $-\frac{5}{11}$

B. $-\frac{4\sqrt{6}}{5}$

C. $-\frac{\sqrt{146}}{11}$

D. $-\frac{11}{5}$

E. $-\frac{\sqrt{146}}{5}$

78. Name the quadrant in which the angle θ lies if $\csc \theta < 0$ and $\cot \theta > 0$.

A. *I*

B. *II*

C. *III*

D. *IV*

D. *V*

79. The angles -11° and 101° are

A. complementary

B. supplementary

C. both acute

D. both obtuse

E. none of the above

80. Find the smallest positive angle coterminal with -980° .

A. 100°

B. 820°

C. 460°

D. -260°

E. -620°

81. Find the point on the unit circle associated with the angle $-\frac{5\pi}{6}$.

A. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

B. $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

C. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

D. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

E. $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

82. Convert $\frac{5\pi}{6}$ to degree measure.

A. 210°

B. 150°

C. 120°

D. 240°

E. 500°

83. Convert -300° to radian measure.

- A. $\frac{11\pi}{4}$
- B. $\frac{5\pi}{6}$
- C. $-\frac{5\pi}{3}$
- D. $\frac{7\pi}{3}$
- E. $\frac{7\pi}{4}$

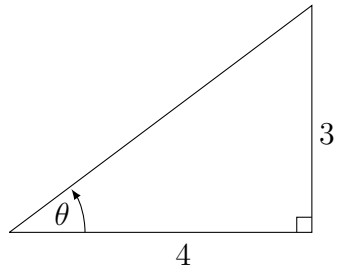
84. Which of the following angles is coterminal with $\frac{5\pi}{4}$?

- A. $-\frac{7\pi}{4}$
- B. $\frac{7\pi}{4}$
- C. $\frac{3\pi}{4}$
- D. $-\frac{\pi}{4}$
- E. $\frac{13\pi}{4}$

85. What is the maximum value of $f(x) = -3 \sin(5x - 4)$?

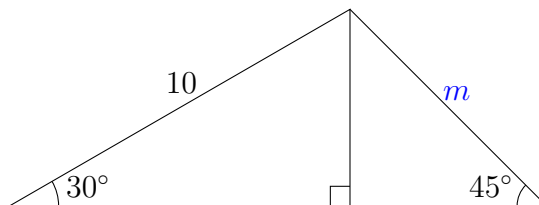
- A. 5
- B. 3
- C. 4
- D. 1.5
- E. 15

86. In the right triangle below, what is $\sin \theta$?



- A. $\frac{4}{5}$
- B. $\frac{3}{5}$
- C. $\frac{3}{4}$
- D. $\frac{4}{3}$
- E. $\frac{4}{7}$

87. In the triangle below, $m = ?$



- A. $3\sqrt{5}$
- B. $4\sqrt{3}$
- C. $5\sqrt{2}$
- D. $6\sqrt{3}$
- E. $2\sqrt{3}$

88. If $0^\circ < \theta < 90^\circ$ and $\sin \theta = 0.5$, what is the value of $\sec \theta$?

- A. $\frac{2}{\sqrt{3}}$
- B. $\frac{\sqrt{3}}{2}$
- C. $-\frac{1}{2}$
- D. $-\frac{\sqrt{3}}{2}$
- E. $\frac{1}{2}$

89. If $\sin(\theta + 2\pi) = 0.4$, $\sin(\theta - 12\pi) = ?$

- A. -0.4
- B. 0.6
- C. 0.4
- D. $\sqrt{0.84}$
- E. $\sqrt{0.48}$

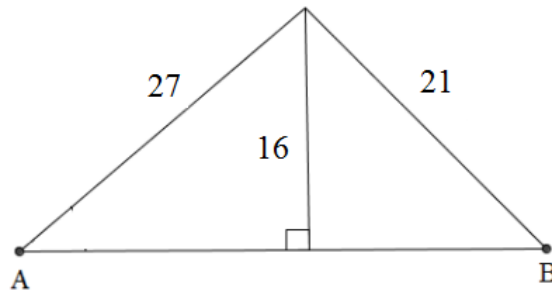
90. If $\cos \theta = 0.7$, $\cos(\theta + \pi) = ?$

- A. 0.7
- B. $\sqrt{0.51}$
- C. -0.3
- D. -0.7
- E. $\sqrt{0.15}$

91. If $f(x) = -4\sin(x + \pi/2)$ and $g(x) = \frac{x}{3}$, then $f(g(\pi/2)) = ?$

- A. $\sqrt{3}/4$
- B. $3\sqrt{3}$
- C. $2\sqrt{3}$
- D. $-2/\sqrt{3}$
- E. $-2\sqrt{3}$

92. Which of the following is closest to the length of segment AB in the figure below?



- A. 24
- B. 48
- C. 37
- D. 34
- E. 53

93. A person standing 150 meters away from the base of a building measures the angle of elevation to the top of the building to be 35° . Approximately how tall is the building.

- A. 105 meters
- B. 123 meters
- C. 86 meters
- D. 214 meters
- E. 155 meters

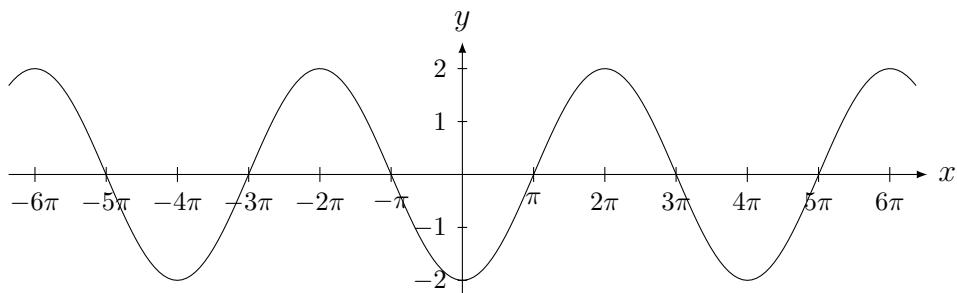
94. If $\tan \theta = 3$ and $\sin \theta < 0$, what is the value of $\cos \theta$?

- A. $\frac{1}{\sqrt{2}}$
- B. $\frac{1}{\sqrt{10}}$
- C. $-\frac{1}{2\sqrt{2}}$
- D. $\frac{1}{2\sqrt{2}}$
- E. $-\frac{1}{\sqrt{10}}$

95. What is the period of the function $y = \cos\left(\frac{3\pi x}{2}\right)$?

- A. $\frac{2}{3}$
- B. $\frac{4\pi}{3}$
- C. $\frac{3\pi}{2}$
- D. $\frac{4}{3}$
- E. $\frac{2}{3}$

96. Find an appropriate function for the following graph:



- A. $y = -2 \cos\left(\frac{\pi x}{2}\right)$
- B. $y = -2 \cos\left(\frac{x}{2}\right)$
- C. $y = -2 \sin\left(\frac{x}{4}\right)$
- D. $y = 2 \sin(2x)$
- E. $y = -\cos(2x)$

97. Which of the following is not an identity?

- A. $1 + \tan^2 \theta = \sec^2 \theta$
- B. $\sin^2 \theta + \cos^2 \theta = 1$
- C. $\tan(2\theta) = 2 \tan \theta$
- D. $\cos(-\theta) = \cos \theta$
- E. $\sin(-\theta) = -\sin \theta$

98. If $180^\circ < \theta < 270^\circ$ and $\tan \theta = \sqrt{3}$, what is the value of $\sin(2\theta)$?

- A. $\frac{1}{\sqrt{3}}$
- B. $\frac{\sqrt{3}}{2}$
- C. $-\frac{1}{4}$
- D. $\frac{1}{2}$
- E. 0.25

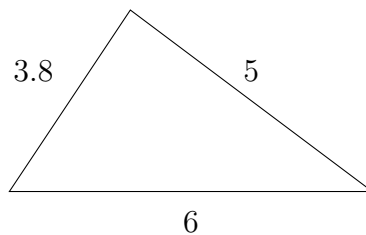
99. If $0 < \theta < \frac{\pi}{2}$ and $\cos \theta = 0.4$, then $\sin\left(\frac{\theta}{2}\right) = ?$

- A. $-\sqrt{0.7}$
- B. $-\sqrt{0.3}$
- C. $\sqrt{0.7}$
- D. $\sqrt{0.3}$
- E. $-\sqrt{0.4}$

100. For what values of x is the graph of $y = -\sin(x)$ always increasing?

- A. $[\pi/2, 3\pi/2]$
- B. $[0, \pi]$
- C. $[\pi, 2\pi]$
- D. $[0, 2\pi]$
- E. $[-\pi/2, \pi/2]$

101. Which of the following is closest to the measure of the angle opposite the side whose length is 6 in the triangle below?



- A. 56°
- B. 39°
- C. 85°
- D. 45°
- E. 67°

Answers

1. C
2. B
3. E
4. C
5. B
6. B
7. D
8. E
9. C
10. A
11. A
12. C
13. E
14. B
15. D
16. A
17. D
18. C
19. E
20. B
21. C
22. A
23. E
24. C
25. E
26. A
27. D
28. B

- 29. C
- 30. B
- 31. E
- 32. B
- 33. D
- 34. A
- 35. D
- 36. A
- 37. B
- 38. E
- 39. D
- 40. B
- 41. C
- 42. B
- 43. E
- 44. B
- 45. D
- 46. A
- 47. D
- 48. D
- 49. C
- 50. A
- 51. A
- 52. C
- 53. D
- 54. D
- 55. A
- 56. C
- 57. A
- 58. E

- 59. D
- 60. A
- 61. A
- 62. B
- 63. B
- 64. A
- 65. C
- 66. E
- 67. B
- 68. D
- 69. A
- 70. D
- 71. C
- 72. E
- 73. B
- 74. C
- 75. B
- 76. A
- 77. E
- 78. C
- 79. E
- 80. A
- 81. B
- 82. B
- 83. C
- 84. E
- 85. B
- 86. B
- 87. C
- 88. A

- 89. C
- 90. D
- 91. E
- 92. D
- 93. A
- 94. E
- 95. D
- 96. B
- 97. C
- 98. B
- 99. D
- 100. A
- 101. C