2015

Post-Test Answer Key Name Key

Class (circle one): Trig Geometry Algebra 2 Date _____

1. B
2. D
3. A
4. A
5. C
6. B
7. D
8. A
9. C
10. D
11. C
12. A
13. B
14. B
15. A
16. B
17. D
18. B
19. A
20. B
21. C
22. D
23. A
24. B
25. D
26. C
27. D
28. A
29. B
30. D
31. B
32. B
33. A
34. D
35. B
36. C
37. D
38. B
39. D
40. C
41. C
42. D
43. D
44. _____
45. _____
46. _____
47. _____
48. _____
49. _____
50. _____
51. _____
52. _____
53. _____
54. _____
55. _____
56. _____
57. _____
58. _____
59. _____
60. _____
61. _____
62. _____
63. _____
64. _____
65. _____
66. _____
67. _____
68. _____
69. _____
70. _____
71. _____
72. _____
73. _____
74. _____
75. _____
76. _____
77. _____
78. _____
79. _____
80. _____

Trigonometry Pre-Test
September 2014

21

Enter the correct letter on your answer sheet.
PLEASE DO NOT WRITE ON TEST.

1. Change 128.433° to degrees, minutes, and seconds.

A. 128° 25' 58" **B.** 128° 25' 59" **C.** 128° 25' 92" **D.** 128° 26' 00"

.433(60) = 25.98 .98(60) = 58.8 = 59

2. Write 43° 18' 35" as a decimal to the nearest thousandth of a degree.

A. 43.306° **B.** 43.308° **C.** 43.309° **D.** 43.310° $43+\frac{18}{60}+\frac{35}{3600}$

3. Give the angle measure represented by 3.25 rotations clockwise.

A. −1170° **B.** −90° **C.** 90° **D.** 1170°

(360)
-3.25

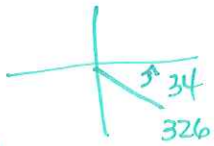
4. Identify all coterminal angles between -360° and 360° for the angle -420°.

A. -60° and 300° **B.** -30° and 330° **C.** 30° and -330° **D.** 60° and -300°

-420 + 360 = -60 -60 + 360 = 330

5. Find the measure of the reference angle for 1046°.

A. -56° **B.** 56° **C.** 34° **D.** -34°

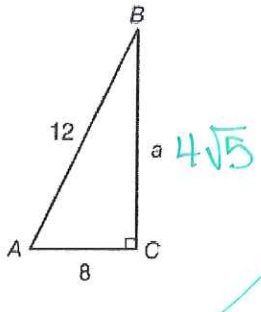


1046 − 360 − 360 = 326

6. Find the value of the tangent for $\angle A$.

A. $\frac{2\sqrt{5}}{2}$ **B.** $\frac{\sqrt{5}}{2}$ **C.** $\frac{2}{3}$ **D.** $\frac{\sqrt{5}}{3}$

$\tan = \frac{O}{A} = \frac{4\sqrt{5}}{8}$



$a^2+b^2=c^2$

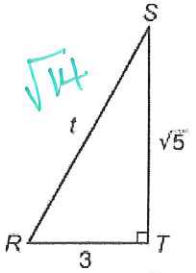
$4\sqrt{5}$

7. Find the value of the secant for $\angle R$.

A. $\frac{\sqrt{70}}{5}$ **B.** $\frac{3\sqrt{14}}{14}$ **C.** $\frac{\sqrt{5}}{3}$ **D.** $\frac{\sqrt{14}}{3}$

$\sec = \frac{h}{adj}$

$\frac{\sqrt{14}}{3}$



8. Which of the following is equal to csc θ ?

A. $\frac{1}{\sin\theta}$ **B.** $\frac{1}{\cos\theta}$ **C.** $\frac{1}{\tan\theta}$ **D.** $\frac{1}{\sec\theta}$

recip. $\frac{1}{0.85} = 1.176$

9. If $\cot \theta = 0.85$, find $\tan \theta$.

A. 0.588 **B.** 0.85 **C.** 1.176 **D.** 1.7

10. Find $\cos(-270°)$. what is cos at 90°?

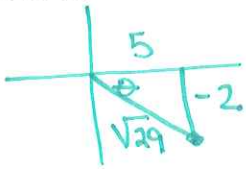
A. undefined **B.** -1 **C.** 1 **D.** 0

11. Find the exact value of $\sec 300°$. $\cos 300 = \frac{1}{2}$ so: $\sec = 2$

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

12. Find the value of $\csc \theta$ for angle θ in standard position if the point at (5, -2) lies on its terminal side.

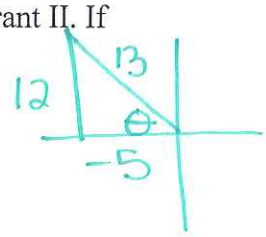
A. $\frac{-\sqrt{29}}{2}$ **B.** $\frac{-2\sqrt{29}}{29}$ **C.** $\frac{\sqrt{29}}{5}$ **D.** $\frac{5\sqrt{29}}{29}$



$\csc = \frac{h}{o}$

13. Suppose θ is an angle in standard position whose terminal side lies in Quadrant II. If $\sin \theta = \frac{12}{13}$, find the value of $\sec \theta$. $\sec = \frac{h}{a}$

A. $\frac{-5}{13}$ **B.** $\frac{-13}{5}$ **C.** $-\frac{12}{5}$ **D.** $\frac{13}{12}$

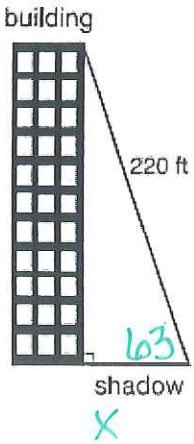


For Exercises 13 and 14, refer to the figure. The angle of elevation from the end of the shadow to the top of the building is 63° and the distance is 220 feet.

$\sin 63 = \frac{x}{220}$

14. Find the height of the building to the nearest foot.

A. 100 ft **B.** 196 ft **C.** 432 ft **D.** 112 ft



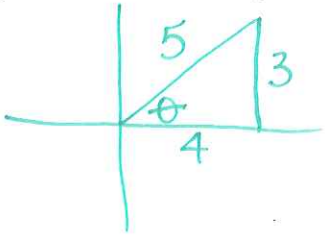
15. Find the length of the shadow to the nearest foot.

A. 100 ft **B.** 196 ft **C.** 432 ft **D.** 112 ft

$\cos 63 = \frac{x}{220}$

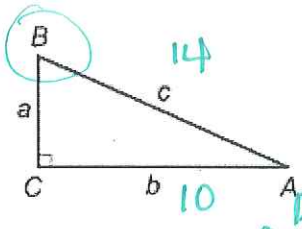
16. Assuming an angle in Quadrant I, evaluate $\csc(\cot^{-1} \frac{4}{3})$

A. $\frac{3}{5}$ **B.** $\frac{5}{3}$ **C.** $\frac{4}{5}$ **D.** $\frac{5}{4}$



$\csc = \frac{h}{o}$

17. Given the triangle at the right, find B to the nearest tenth of a degree if $b = 10$ and $c = 14$.



A. 44.4° B. 35.5° C. 54.5° D. 45.6°

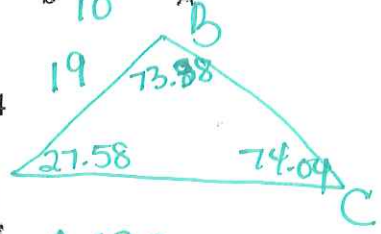
$\sin B = \frac{10}{14}$

$\sin^{-1}\left(\frac{10}{14}\right)$

18. In ΔABC, $A = 27° 35'$, $B = 78° 23'$, and $c = 19$. Find a.

A. 8.6 B. 9.2 C. 12.8 D. 19.4

$\frac{\sin 74.04}{19} = \frac{\sin 27.58}{a}$



19. Determine the number of possible solutions if $A = 62°$, $a = 4$, and $b = 6$.

A. none B. one C. two D. three

$A < 90$

$a < b$

$b \sin A$

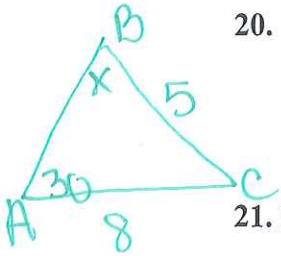
$6 \sin 63$

$a < 5.3$

no sol

20. Determine the greatest possible value for B if $A = 30°$, $a = 5$, and $b = 8$.

A. 23.1° B. 53.1° C. 126.9° D. 96.9°

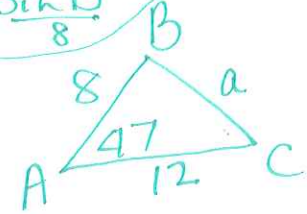


$\frac{\sin 30}{5} = \frac{\sin B}{8}$

21. In ΔABC, $A = 47°$, $b = 12$, and $c = 8$. Find a.

A. 6.3 B. 11.9 C. 8.8 D. 18.4

$a^2 = (8)^2 + (12)^2 - 2(8)(12)\cos 47$



22. If $a = 22$, $b = 14$, and $c = 30$, find the area of ΔABC.

A. 33 units^2 B. 121.0 units^2 C. 130.2 units^2 D. 143.8 units^2

$22^2 = 14^2 + 30^2 - 2(14)(30)\cos A$

$A = 43.2$

$\text{Area} = \frac{1}{2}(14)(30)\sin 43.2$

23. Change 1400° to radian measure in terms of π.

A. $\frac{70\pi}{9}$ B. $\frac{35\pi}{9}$ C. $\frac{140\pi}{9}$ D. None of these

$\frac{1400 \cdot \pi}{180}$

24. Change $\frac{29\pi}{37}$ radians to degree measure.

A. 5220° B. 141.1° C. 167.6° D. 66.6°

$\frac{29\pi}{37} \cdot \frac{180}{\pi}$

25. Determine the angular velocity if 0.75 revolutions are completed in 0.05 seconds.

A. 4.7 radians/s B. 47.1 radians/s
C. 9.4 radians/s D. 94 radians/s

$\frac{75(2\pi)}{0.05}$

26. Determine the linear velocity of a point rotating at 25 revolutions per minute at a distance of 2 feet from the center of the rotating object.

A. 2.6 ft/s B. 314.2 ft/s C. 5.2 ft/s D. 78.5 ft/s

$2\left(\frac{25(2\pi)}{1\text{min}} \cdot \frac{1\text{min}}{60\text{sec}}\right)$

27. There are 20 rollers under a conveyor belt and each roller has a radius of 15 inches. The rollers turn at a rate of 40 revolutions per minute. What is the linear velocity of the conveyor belt?
A. 3769.9 ft/s B. 104.7 ft/s C. 5.2 ft/s D. 62.8 ft/s

28. Find the degree measure of the central angle associated with an arc that is 16 inches long in a circle with a radius of 12 inches.
A. 76.4° B. 270.0° C. 283.6° D. 43.0°

29. Find the area of a sector if the central angle measures 105° and the radius of the circle is 4.2 meters.
A. 7.7 m^2 B. 16.2 m^2 C. 32.3 m^2 D. 926.1 m^2

30. Write an equation of the sine function with amplitude 3, period $\frac{3\pi}{2}$, and phase shift $\frac{\pi}{4}$.
A. $y = \pm 3 \sin(\frac{3x}{2} - \frac{\pi}{4})$ B. $y = \pm 3 \sin(\frac{4x}{3} - \frac{\pi}{4})$
C. $y = \pm 3 \sin(\frac{3x}{2} - \frac{3\pi}{8})$ D. $y = \pm 3 \sin(\frac{4x}{3} - \frac{\pi}{3})$

31. Write an equation of the tangent function with period $\frac{3\pi}{8}$, phase shift $-\frac{\pi}{5}$, and vertical shift -2.
A. $y = \tan(\frac{8x}{3} - \frac{8\pi}{15}) - 2$ B. $y = \tan(\frac{8x}{3} + \frac{8\pi}{15}) - 2$
C. $y = \tan(\frac{16x}{3} + \frac{3\pi}{80}) - 2$ D. $y = \tan(\frac{8x}{3} - \frac{3\pi}{40}) - 2$

32. State the amplitude, period, and phase shift of the function $y = -3\cos(3x + \frac{3\pi}{2})$.
A. 3; 2π; $\frac{-\pi}{2}$ B. 3; $\frac{2\pi}{3}$; $\frac{-\pi}{2}$
C. -3; 2π; $\frac{\pi}{2}$ D. 3; $\frac{2\pi}{3}$; $\frac{3\pi}{2}$

33. State the period and phase shift of the function $y = -4 \tan(\frac{1}{2}x + \frac{3\pi}{8})$.
A. 2π, $-\frac{3\pi}{4}$ B. π, $\frac{3\pi}{8}$ C. 2π, $\frac{3\pi}{8}$ D. π, $-\frac{3\pi}{8}$

34. What is the equation for the inverse of $y = \text{Cos } x + 3$?

$x = \text{Cos } y + 3$

$x - 3 = \text{Cos } y$

$\text{Arc Cos}(x-3) = y$

A. $y = \text{Arccos}(x + 3)$ B. $y = \text{Arccos } x - 3$

C. $y = \text{Arccos } x + 3$ D. $y = \text{Arccos}(x - 3)$

35. Evaluate $\tan\left(\text{Cos}^{-1}\frac{\sqrt{3}}{2} + \text{Tan}^{-1}\frac{\sqrt{3}}{3}\right)$

$= \tan(30+30) = \tan 60$

A. $\frac{\sqrt{3}}{3}$ B. $\sqrt{3}$ C. 0 D. undefined

36. ***Kala is jumping rope, and the rope touches the ground every time she jumps. She jumps at the rate of 40 jumps per minute, and the distance from the ground to the midpoint of the rope at its highest point is 5 feet. At $t = 0$ the height of the midpoint is zero.*** Write a function with phase shift 0 for the height of the midpoint of the rope above the ground after t seconds.

Period

$\frac{60}{40} = \frac{3}{2}$

$\frac{2\pi}{k} = \frac{3}{2}$

$3k = 4\pi$

$k = \frac{4\pi}{3}$

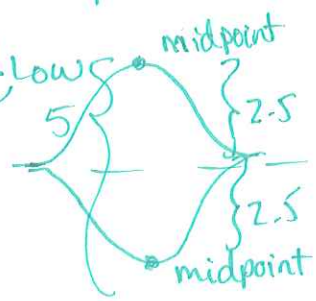
A. $= 2.5\cos(3\pi t) + 2.5$ B. $h = 2.5\sin(3\pi t) + 2.5$

C. $h = -2.5\cos\left(\frac{4\pi}{3}t\right) + 2.5$ D. $h = -2.5\sin\left(\frac{4\pi}{3}t\right) + 2.5$

cos b/c jumping rope

of the rope

Amp = 2.5



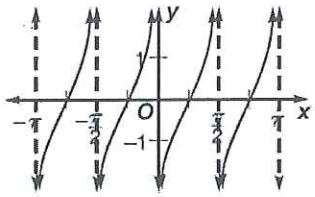
37. Find the values of x for which the equation $\sin x = -1$ is true.

A. $2\pi n$ B. $\frac{\pi}{2} + 2\pi n$ C. $\pi + 2\pi n$ D. $\frac{3\pi}{2} + 2\pi n$

38. What is the equation of the graph shown at the right?

A. $y = \tan 2x$ B. $y = \tan\left(2x + \frac{\pi}{2}\right)$

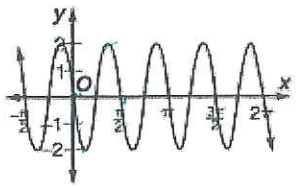
C. $y = \cot 2x$ D. $y = \cot\left(2x + \frac{\pi}{2}\right)$



39. What is the equation of the graph shown at the right?

A. $y = 2\cos\frac{x}{4}$ B. $y = 2\cos 4x$

C. $y = -2\sin\frac{x}{4}$ D. $y = -2\sin 4x$



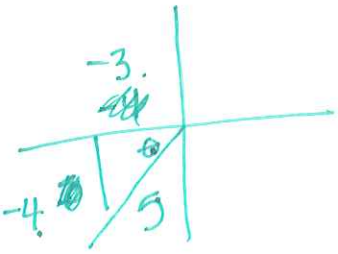
40. Find an expression equivalent to $\frac{\sec\theta\tan\theta}{\sin\theta}$

$= \frac{\frac{1}{\cos}\cdot\frac{\sin}{\cos}}{\sin} = \frac{\sin^2\theta}{\cos^2\theta} = \tan^2\theta$

A. $\sec^2\theta$ B. $\cot\theta$ C. $\tan^2\theta$ D. $\cos^2\theta$

41. If $\csc\theta = -\frac{5}{4}$ and $180° < \theta < 270°$, find $\tan\theta$.

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



42. Simplify $\frac{\tan^2\theta\csc^2\theta - 1}{\tan^2\theta}$.

A. $\csc^2\theta$ B. -1 C. $\tan^2\theta$ D. 1

43. Simplify $\frac{\cos x}{\sec x - 1} + \frac{\cos x}{\sec x + 1}$.

A. $2\tan^2 x$ B. $2\cos x$ C. $2\cos^2 x - 1$ D. $2\cot^2 x$

44. Use a sum or difference identity to find the exact value of $\sin 255°$.

A. $\frac{-\sqrt{2}-\sqrt{6}}{4}$ B. $\frac{\sqrt{6}-\sqrt{2}}{4}$ C. $\frac{\sqrt{6}+\sqrt{2}}{4}$ D. $\frac{\sqrt{2}-\sqrt{6}}{4}$

45. Find the value of $\tan(\alpha - \beta)$ if $\cos\alpha = -\frac{3}{5}$, $\sin\beta = \frac{5}{13}$, $90° < \alpha < 180°$, and $90° < \beta < 180°$.

A. $\frac{63}{56}$ B. $-\frac{63}{56}$ C. $-\frac{33}{56}$ D. $\frac{33}{56}$

46. Find a numerical value of one trigonometric function of x if $\frac{\tan x}{\cot x} - \frac{\sec x}{\cos x} = \frac{2}{\csc x}$.

A. $\csc x = 1$ B. $\sin x = -\frac{1}{2}$ C. $\csc x = -1$ D. $\sin x = \frac{1}{2}$

47. If $\cos\theta = 0.8$ and $270° < \theta < 360°$, find the exact value of $\sin 2\theta$.

A. -0.96 B. -0.6 C. 0.96 D. 0.28

48. Use a half-angle identity to find the exact value of $\cos 165°$.

A. $\frac{1}{2}\sqrt{2+\sqrt{3}}$ B. $-\frac{1}{2}\sqrt{2+\sqrt{3}}$

C. $\frac{1}{2}\sqrt{2+\sqrt{2}}$ D. $-\frac{1}{2}\sqrt{1+\sqrt{3}}$

49. If $\csc\theta = -\frac{5}{3}$ and θ has its terminal side in Quadrant III, find the exact value of $\tan 2\theta$.

A. $\frac{24}{25}$ B. $\frac{7}{25}$ C. $\frac{24}{7}$ D. $-\frac{7}{25}$