TRUE OR FALSE

1. The reciprocal of sine is cosecant.
   TRUE
2. The function y = sin x is an odd function
   TRUE
3. A sine function is a periodic function
   TRUE
4. The reciprocal of tangent is cotangent
   TRUE
5. If sin A < 0 and cos A > 0, then sin 2A < 0
   TRUE
6. The reciprocal of tangent is secant.
   FALSE
7. Sin (A + B) = sin A cos B + sin cos A
   TRUE
8. sec2Θ + tan2Θ = 1
   FALSE
9. $\sin\frac{A}{2} = \pm\sqrt{\frac{1+\cos A}{2}}$
   FALSE
10. The y-intercept of y = sin x is 1
    FALSE
11. A cosine function has only one y-intercept
    FALSE
12. If sec A < 0, then sin A < 0
    FALSE
13. If sec A < 0, then sin A < 0
    FALSE
14. $\tan\frac{A}{2} = \frac{\sin A}{1+\cos A}$
    TRUE

QUESTIONS AND ANSWERS:

1. What is the domain of y = sin x?

   $\{x | x \in \mathbb{R}\}$

2. What are the x-intercepts y = cos x?

   $k\frac{\pi}{2}$, where k is an odd integer

3. If sinΘ cosΘ = $\frac{12}{25}$, then what is the value of (sinΘ + cosΘ) 2

   $\frac{49}{25}$

4. What is the value of $sin^2\,\Theta$ + 4 + $cos^2\,\Theta$?

   5

5. Which of the following is NOT ALWAYS equal to $tan^2\,\Theta$?

   1 + $sec^2\,\Theta$

   a. $\frac{\cos^2\theta}{\sin^2\theta}$

   b. $\frac{\sin^2\theta}{\cos^2\theta}$

   c. $1 + \sec^2\Theta$

   d. $\frac{1}{\cot^2\theta}$

6. What is the simplest form of cscΘ cotΘ $sin^2\,\Theta$?

   $cos\,\Theta$

7. Which of the following is one of the eight fundamental identities?

   a. $\sin^2\theta - \cos^2\theta = 1$

   b. $\tan\theta = \frac{1}{\sec\theta}$

   c. $\csc\theta = \frac{1}{\sin\theta}$

   d. $\csc^2\theta - \tan^2\theta = 1$

8. What is the value of $csc^2\,\Theta$ + 7 - $cot^2\,\Theta$?

8

9. If sin A = $\frac{2}{3}$ and Θ is in the third quadrant, then what is cos Θ?

- $\frac{2}{13}$

10. What is the simplest form of cotΘ secΘ $sin^2 \Theta$?

sin Θ

11. If csc Θ = $\frac{7}{5}$, then what is 7(1 + sin Θ)?

12

12. If csc Θ = $\frac{19}{11}$, then what is the value of $sec^2 \Theta$ - sin Θ - $tan^2 \Theta$?

$\frac{8}{19}$

13. Find the exact value of sin $\frac{\pi}{12}$

$\frac{\sqrt{6}-\sqrt{2}}{4}$

14. cos $(\pi - x)$?

cos π cos x + sin π sin x

15. Tan (x-y) = ?

$\frac{\tan x - \tan y}{1+\tan x \tan y}$

16. Which of the following statements is an identity?

a. $\cos\frac{A}{2} = \pm\sqrt{\frac{1+\cos A}{2}}$

b. $\cos\frac{A}{2} = \pm\sqrt{\frac{1+\sin A}{2}}$

c. $\cos\frac{A}{2} = \pm\sqrt{\frac{1-\sin A}{2}}$

d. $\cos\frac{A}{2} = \pm\sqrt{\frac{1-\cos A}{2}}$

17. Which of the following expressions is equivalent to sin (x-y)

sin x cos y - cos x sin y

18. Which of the following is an identity?

- a. cos (A + B) = cos A cos B + sin A sin B
- b. sin (A + B) = sin A cos B – cos A sin B
- c. sin (A + B) = sin A cos B + cos A sin B
- d. cos (A + B) = sin A cos B – cos A sin B

19. Which of the following is equivalent to sin $\frac{A}{2}$?

$$\pm\sqrt{\frac{1-\cos A}{2}}$$

20. What are the possible locations of y = $tan^{-1}\ \frac{7}{2}$?

QI and QIII

21. If tan A = 4/3, then what is cos A?

3/5

22. Which of the following is not equivalent to tan $\frac{A}{2}$?

- a. $\frac{\sin A}{1+\cos A}$
- b. $\frac{1-\cos A}{\sin A}$
- c. $\frac{1}{\cot\frac{A}{2}}$
- d. $\frac{\tan A}{2}$

23. Which of the following is not equivalent to cos $\frac{A}{2}$?

- a. $2\cos^2 A - 1$
- b. 2cosA sin A
- c. $1 - 2\sin^2 A$
- d. $\cos^2 A - \sin^2 A$

24. If there are no restrictions to the values of y, then which of the following is not solution to y = cos^{-1} -1?

2π

25. If $\frac{4\sec^2\theta - 4\tan^2\theta}{2\sin^2\theta + 2\cos^2\theta}$, then what is the value of cos 2A?

Select one:

- a. $\frac{7}{25}$

26. If $\sin A = \frac{5}{13}$ and $\cos A > 0$, then what is $\sin\frac{A}{2}$? ?

Select one:

- a. $\frac{\sqrt{26}}{26}$

27. Which of the following is a characteristic of y = -5 sin x?

Its amplitude is 5

28. if $\sin\Theta = -\frac{5}{13}$ and Θ is in the fourth quadrant, then what is cos Θ?

12/13

29. tan (x + y) =?

$$\frac{\tan x + \tan y}{1 - \tan x \tan y}$$

30. Which of the following is the reciprocal of sec Θ?

cos Θ

31. What is the value of $\csc^2\Theta$ - 3 - $\cot^2\Theta$?

-2

32. Which of the following expressions is equivalent to cos 2B?

$\cos^2 B - \sin^2 B$

33. sin (2π – y) = ?

sin 2π cos y – cos 2π sin y

34. Which of the following is equal to $sin^2 \Theta$?

a. $1 - \cot^2\Theta$

b. $\frac{1}{\csc^2 \theta}$

c. $1 + \cos^2\Theta$

d. $\frac{1}{\cos^2 \theta}$

35. What is the period of the graph of y = cos 2x?

π

36. What is the range of y = cos x?

$\{y|y \in \mathbb{R}, -1 \leq y \leq 1\}$

37. What is the product of (sin Θ + cos Θ) (sin Θ + cos Θ) ?

1 + 2 sin Θ cos Θ

38. Which of the following expressions has a product of 1?

csc Θ sin Θ

39. If $\csc \Theta = -\frac{41}{9}$ is in QIV, then what is cos Θ?

40/41

40. Which of the following expressions is equivalent to cos (x+y)

cos x cos y - sin x sin y

41. What is the y-intercept of y = sin x?

0

42. Find the exact value of tan.

(Hint: $\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$)

Select one:

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

43. Given that f(x) = cos x. What is $f(-\frac{\pi}{3})$?

1/2

44. If $\tan A = \frac{4}{3}, \tan B = \frac{8}{15}$, then what is the value of tan (A + B)?

84/13

NOTES:

ANGLES AND THEIR MEASURES

INITIAL SIDE - is the side of an angle that is stationary or doesn't move. Doesn't have to be in the positive x-axis. If it is, then it is said to be in the *standard position*.

STANDARD POSITION - is an angle whose vertex is at origin and whose initial side is on positive x-axis.

QUADRANTAL ANGLE - if the terminal side of an angle in the standard position is in one of the axes.

TERMINAL SIDE - is the side of the angle that moves around in either clockwise or counterclockwise direction.

COTERMINAL ANGLE - if the terminal side of two angles in the standards position coincide. They don't have to be of the same sign.

MEASUREMENT OF ANGLES

1. REVOLUTIONS: revs = s/2nr
2. DEGREES: (number of revolutions) (360)
3. RADIANS: (number of degrees((n/180) / (number of revolutions)(2n)

UNIT CIRCLE - it is a circle that has a center at the origin and a radius of 1 unit.

In a 30-60-90 triangle, the leg opposite the 30-degree angle is half the hypotenuse while the leg opposite the 60 degree angle is longer than the leg opposite the 30 degree angle by a factor of square root of 3.

Graph of Sine

- This means that the domain of the graph is the set of real numbers.
- It is also apparent that the y values are limited. It can go as low as – 1 and as high as 1. The range is $\{y|y \in \mathbb{R}, -1 \leq y \leq 1\}$
- This means that y will be zero whenever x = kπ, where k is an integer
- The y-intercept is zero
- The sine function is therefore an odd function.
- Another property that we can explore is the amplitude. The amplitude of a sine function of the form y = a·sin x is |a|.

Graph of Cosine

- Its domain of the graph is the set of real numbers.
- The range is $\{y|y \in \mathbb{R}, -1 \leq y \leq 1\}$
- This means that y will be zero whenever x = $k\,\pi\,2$, where k is an odd integer.
- The graph is also periodic and the period is 2π.
- The y-intercept is one.
- The cosine function is therefore an even function
- The amplitude of y = cos x is 1. Just like in the sine function, the amplitude varies depending on the value of a in y = a·cos x