

Name: _____
School: _____

Trigonometry Individual 2017

St. Paul's Tournament

1. If $\sin x = \frac{4}{7}$, and the angle is located in Quadrant I, find $\sec x$.
2. If $\tan x = a$, what does $\tan(-x)$ equal?
3. Solve over the interval $[0, 2\pi)$: $\cot \theta \cos \theta = \cos \theta$
4. Convert $\frac{7\pi}{18}$ to degrees.
5. Find the exact value of $\sin \frac{7\pi}{12}$.
6. Simplify $42 \sin^2 x + 42 \cos^2 x$.
7. If $\sec x = \frac{\sqrt{11}}{3}$ (in the Quadrant IV), find $\tan x$.
8. Find $\tan(\sin^{-1} \frac{5}{13})$.
9. Find the area of a triangle with sides of length 5 and 7 and an included angle measuring 45° .
10. Find the exact length of the arc in a circle with radius 15 cm and a central angle measuring 140° .
11. How many triangles $\triangle ABC$ exist such that $a = 5$, $b = 6$, and $\angle A = 95^\circ$
12. Solve over the interval $[0, 2\pi)$: $2 \cos^2 x - \cos x - 1 = 0$.

13. Find the value of the phase shift in $f(x) = -5 \sin(3x - 7\pi)$.
14. Convert 625° to radians.
15. Find the exact value of $\sin^{-1}(\sin(\frac{5\pi}{6}))$
16. Solve over the interval $[0, 2\pi)$: $\tan^3 x - \tan^2 x = 0$.
17. Find secant of an angle in standard position with terminal ray passing through point $(-3, -6)$.
18. Determine the quadrant in which the terminal side of θ lies if $\sin \theta > 0$ and $\sec \theta < 0$.
19. Given $\csc x = \frac{13}{5}$, find $\sec x \cdot \tan x$.
20. Find all values for θ in the interval $[0, 2\pi)$ for the equation $4 \sin^2 \theta = 1$.

Answers

1. $\frac{7\sqrt{33}}{33}$
2. $-a$
3. $\theta = \frac{\pi}{4}, \frac{\pi}{2}, \frac{5\pi}{4}, \frac{3\pi}{2}$
4. 70°
5. $\frac{\sqrt{2}}{4}(\sqrt{3} + 1)$
6. 42
7. $-\frac{\sqrt{2}}{3}$
8. $\frac{5}{12}$
9. $\frac{35\sqrt{2}}{4}$
10. $\frac{35\pi}{3}$
11. no such triangles exist
12. $x = 0, \frac{2\pi}{3}, \frac{4\pi}{3}$
13. $\frac{7\pi}{3}$
14. $\frac{125\pi}{36}$
15. $\frac{\pi}{6}$
16. $x = 0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}$
17. $-\sqrt{5}$
18. Quadrant II
19. $\frac{65}{144}$
20. $\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$