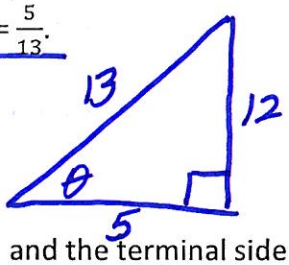
*AAT

Name: Key

Chapter 6: Test Review

Date: / Period:

1. Find the values of the other five trig functions for the acute angle θ if $\cos\theta = \frac{5}{13}$.

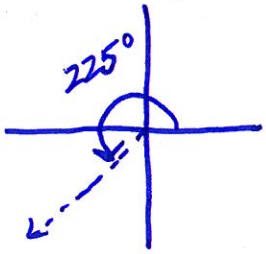


$\sin\theta = \frac{12}{13}$ $\quad \csc\theta = \frac{13}{12}$

$\sec\theta = \frac{13}{5}$

$\tan\theta = \frac{12}{5}$ $\quad \cot\theta = \frac{5}{12}$

2. Find the exact values of the six trig functions of θ if θ is in standard position and the terminal side of θ is in the third quadrant and bisects the quadrant.

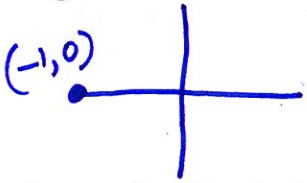


$\sin 225° = \frac{-\sqrt{2}}{2}$ $\quad \csc 225° = -\sqrt{2}$

$\cos 225° = \frac{-\sqrt{2}}{2}$ $\quad \sec 225° = -\sqrt{2}$

$\tan 225° = 1$ $\quad \cot 225° = 1$

3. Use a formula for negatives to find the value of sec (-180°).



$\cos(-180°) = \cos 180° = -1$

$\sec(-180°) = \sec 180 = \frac{1}{-1} = -1$

4. Verify the identity by transforming the left-hand side into the right-hand side.

$\sin(-x)\sec(-x) = -\tan(x)$

$-\sin x \cdot \frac{1}{\cos x} =$

$\frac{-\sin x}{\cos x} =$

$-\tan x = -\tan x$

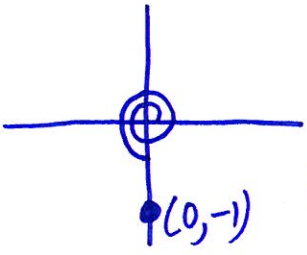
5. Find y by referring to the graph of the trig function.

As $x \to (\frac{\pi}{4})^-$, $\csc x \to y$

$\sin 45° = \frac{\sqrt{2}}{2}$

$\csc 45° = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

6. Refer to the graph of y = sin x to find the separate values of x in the interval [0, 4π] that satisfy the equation sin x = -1.



270°, 630°

$x = \frac{3\pi}{2}, \frac{7\pi}{2}$

7. Approximate to the nearest 0.1°, all angles θ in the interval [0°, 360°) that satisfy the equation sin θ = 0.7584.

$\theta = \sin^{-1}(.7584)$

$\theta = 49.3^\circ$

$180 - 49.3^\circ = 130.7^\circ$

8. Approximate to the nearest 0.1°, all angles θ in the interval [0, 2π) that satisfy the equation sec θ = 1.6024.

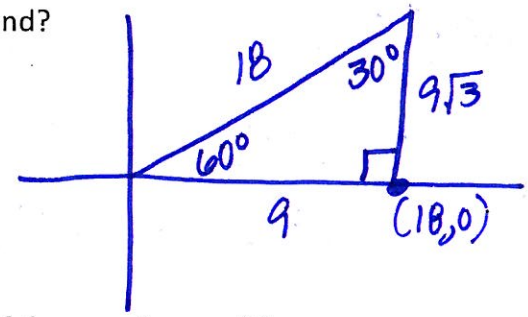
radian mode

$\theta = \cos^{-1}\left(\frac{1}{1.6024}\right) = .9$

$\frac{6.28}{-.9}$

$5.38 \approx 5.4 = \theta$

9. Suppose a robot has a straight arm 18 inches long that can rotate about the origin in a coordinate plane. If the robot's hand is located at (18,0) and then rotates through an angle of 60°, what is the new location of the hand?



$(9, 9\sqrt{3})$

10. Find the period of the equation y = 3 tan x.

$per = \frac{\pi}{|b|} = \frac{\pi}{1} = \pi$

11. Find the period of the equation y = cot $(x + \frac{2\pi}{3})$.

$per = \frac{\pi}{|b|} = \frac{\pi}{1} = \pi$

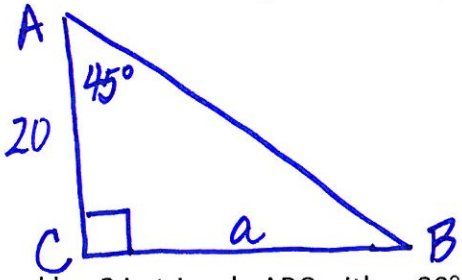
12. Find the period of the equation y = -3 tan $(\frac{1}{3}x - \frac{\pi}{3})$.

$per = \frac{\pi}{|b|} = \frac{\pi}{\frac{1}{3}} = 3\pi$

13. Find the period of the equation y = csc 2πx.

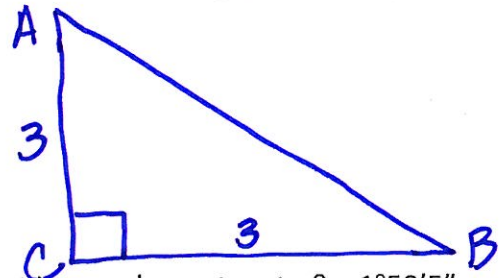
$per = \frac{2\pi}{|b|} = \frac{2\pi}{2\pi} = 1$

14. Given that $\alpha = 45°$ and $b = 20$ in triangle ABC with $\gamma=90°$, find the value of a.



$a = 20$

15. Given that $a = 3$ and $b = 3$ in triangle ABC with $\gamma=90°$, find the value of c.

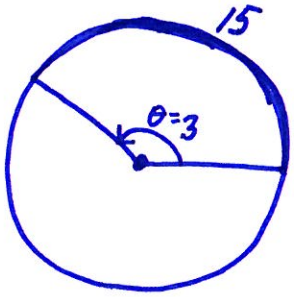


$c = 3\sqrt{2}$

16. Find the angle that is complementary to $\theta = 1°59'5''$.

$$\begin{array}{r} 89°57'60'' \\ -\ 1°59'5'' \\ \hline 88°0'55'' \end{array}$$

17. If a circular arc of the length $s = 15$ cm subtends the central angle $\theta = 3$ on a circle, find the radius of the circle.



$s = r \cdot \theta$

$15 = r \cdot 3$

$5 = r$

18. If a tornado has a core diameter of 250 feet and maximum wind speed of 150 mi/hr (or 220 ft/sec) at the perimeter of the core, approximate the number of revolutions the core makes each minute.

$s = r \cdot \theta$

$\frac{s}{r} = \theta$

$\frac{220}{125} = 1.76$ rad/sec

$\times 60$

105.6 rad/min

2π

$= 16.8$ rev/min

$c = \pi d$

$\frac{1 \text{ rev}}{250\pi \text{ ft}} \left| \frac{220 \text{ ft}}{1 \text{ sec}} \right| \frac{60 \text{ sec}}{1 \text{ min}}$

-or-

$\frac{220 \cdot 60}{250\pi} = 16.8$ rev/min