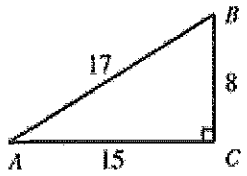
Name: KEY Hour: _____ Date: _____ ID: Practice

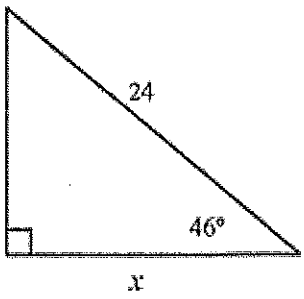
Algebra 2 -- Practice Trig Test

1. Write sin B as a fraction in lowest terms.



sin B = $\frac{15}{17}$

2. Find x to the nearest hundredth.



$\cos 46 = \frac{x}{24}$

$24 \cos 46 = x$

x = 16.67

3. Convert 240° to radians.

$240° \cdot \frac{\pi}{180} = \frac{240\pi}{180} = \frac{4\pi}{3}$

4. Convert $\frac{17}{20}\pi$ to degrees.

$\frac{17\pi}{20} \cdot \frac{180}{\pi} = 153°$

5. Find the reference angle for $\frac{5\pi}{4}$.

$\frac{5\pi}{4} = 225°$ $225 - 180 = 45°$

Reference angle = 45° OR $\frac{\pi}{4}$

Find all possible values θ (between 0 and 360) for which...

6. sin $\theta = -0.342$

$\sin^{-1}(-0.342) \approx -20$ so $\theta = 360 - 20 = 340°$

2nd answer is in Quadrant III

$180 + 20 = 200°$

↑ sin is negative in quadrants III and IV

θ = 340° or θ = 200°

7. tan $\theta = 11.43$

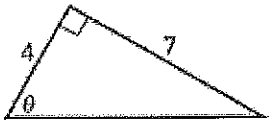
$\tan^{-1}(11.43) = 85°$

2nd answer is in Quadrant III $180 + 85 = 265°$

↑ tan is positive in Quadrants I and III

θ = 85° or θ = 265°

8. Find the measure of the angle θ. Round to hundredths.

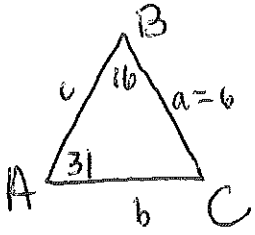


$\tan\theta = \frac{7}{4}$

$\tan^{-1}\left(\frac{7}{4}\right) = 60.26^\circ$

$\theta = 60.26^\circ$

9. Solve triangle ABC with $a = 6$, $A = 31°$, and $B = 16°$. Round your answers to two decimal places.



$\frac{\sin A}{a} = \frac{\sin B}{b} \rightarrow \frac{\sin 31}{6} = \frac{\sin 16}{b}$ $\quad b = 3.21$

$\angle C = 180 - (31 + 16) = 133^\circ$

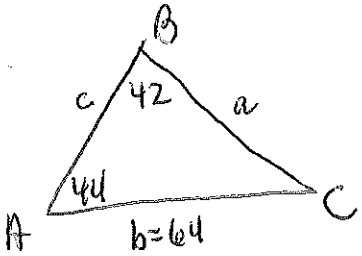
$\frac{\sin C}{c} = \frac{\sin A}{a}$

$\frac{\sin 133}{c} = \frac{\sin 31}{6}$

$c = 8.52$

b = 3.21 c = 8.52 $\angle C = 133^\circ$

10. Solve triangle ABC given that $A = 44°$, $B = 42°$, and $b = 64$. Round to hundredths.



$\frac{\sin A}{a} = \frac{\sin B}{b} \rightarrow \frac{\sin 44}{a} = \frac{\sin 42}{64}$ $\quad a = 66.44$

$\angle C = 180 - (44 + 42) = 94$

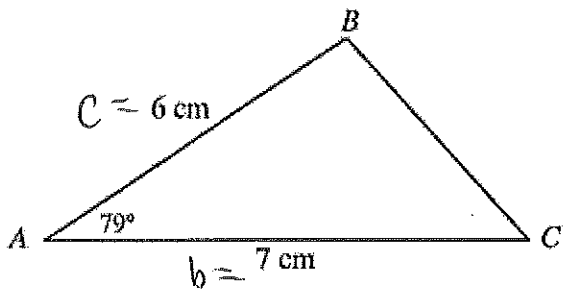
$\frac{\sin C}{c} = \frac{\sin B}{b}$

$\frac{\sin 94}{c} = \frac{\sin 42}{64}$

$c = 95.41$

a = 66.44 c = 95.41 $\angle C = 94^\circ$

11. Find the area of ΔABC. The figure is not drawn to scale.

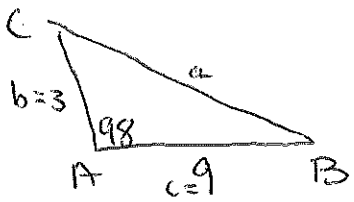


$\text{Area} = \frac{1}{2}bc\sin A$

$= \frac{1}{2}(7)(6)\sin 79$

$= 20.61 \text{ un}^2$

12. Solve triangle ABC with $b = 3$, $c = 9$, and $A = 98°$. Round your answers to two decimal places.



SAS - Use Law of Cosines

$a^2 = b^2 + c^2 - 2bc\cos A$

$a^2 = 3^2 + 9^2 - 2(3)(9)\cos 98$

$a^2 = 90 - 54\cos 98$

$a = 9.87$

$\frac{\sin A}{a} = \frac{\sin B}{b}$

$\frac{\sin 98}{9.87} = \frac{\sin B}{3}$

$B = 17.52$

a = 9.87 $\quad \angle B = 17.52°$ $\quad \angle C = 64.48°$

$\angle C = 180 - (98 + 17.52)$

13. Solve triangle ABC given that $a = 20$, $b = 21$, and $c = 10$. Round to hundredths.

Find $\angle B$ first. SSS - Use Law of Cosines

$b^2 = a^2 + c^2 - 2ac\cos B$

$21^2 = 20^2 + 10^2 - 2(20)(10)\cos B$

$441 = 500 - 400\cos B$

$-59 = -400\cos B$

$81.52 = B$

$\frac{\sin A}{a} = \frac{\sin B}{b}$

$\frac{\sin A}{20} = \frac{\sin 81.52}{21}$

$A = 70.38$

$\angle A = 70.38$ $\quad \angle B = 81.52$ $\quad \angle C = 28.1°$

$\angle C = 180 - (70.38 + 81.52)$

14. Find the arc length of a sector with a radius of 9 feet and a central angle of 18°.

$\text{Arc Length} = \frac{18}{360} \cdot (2\pi \cdot 9) =$ [illegible]

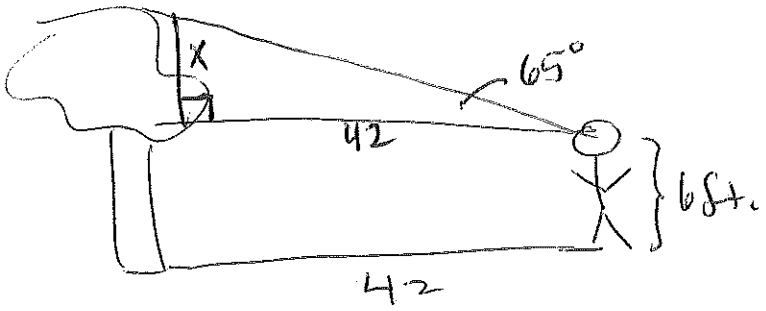
$= \frac{1017.87}{360} = 2.83 \text{ ft.}$

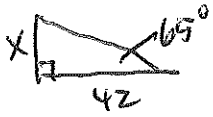
$\text{Sector Area} = \frac{18}{360}(\pi r^2)$

$= \frac{18\pi(81)}{360}$

$= 12.72 \text{ ft}^2$

15. You are standing 42 feet from the base of a tree. Then angle of elevation from your eyes to the top of the tree is $65°$. If the height at eye level is 6 feet, what is the height of the tree to the nearest foot?





$\tan 65 = \frac{x}{42}$

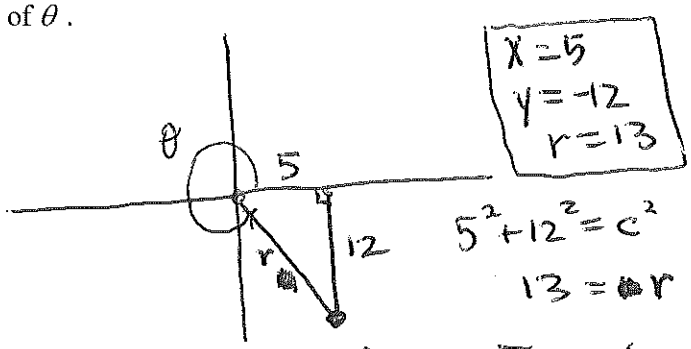
$42 \tan 65 = x$

$90.07 = x$

height of tree $= 90.07 + 6$

$= 96.07$ ft.

16. The point (5, -12) is on the terminal side of angle θ in standard position. Evaluate the six trigonometric functions of θ.



$x = 5$
$y = -12$
$r = 13$

$5^2 + 12^2 = c^2$

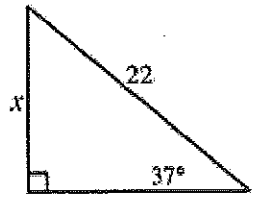
$13 = r$

$\sin\theta = \frac{y}{r} = \frac{-12}{13}$ $\cos\theta = \frac{x}{r} = \frac{5}{13}$ $\tan\theta = \frac{y}{x} = \frac{-12}{5}$

$\csc\theta = \frac{r}{y} = \frac{13}{-12}$ $\sec\theta = \frac{r}{x} = \frac{13}{5}$ $\cot\theta = \frac{x}{y} = \frac{5}{-12}$

* In Quadrant IV cos (and sec) are positive. The rest are negative.

17. Find x. Round the result to the nearest hundredth.



$\sin 37 = \frac{x}{22}$

$22 \sin 37 = x$

$x = 13.24$

Name KEY

Trig Practice Test Part 1

NO CALCULATOR OR NOTES!

Complete each part for each expression:

A. Determine in which quadrant the angle θ lies.
B. Determine the reference angle θ'. (Complete this part only if the angle is not in the first quadrant.)
C. Find the indicated ratio for θ'. This must be an exact value. (Complete this part only if the angle is not in the first quadrant.)
D. Determine the value for the original expression using the ASTC mneumonic.

	A.	B.	C.	D.
1. sin 315	IV	45°	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$
2. tan $\frac{2\pi}{3}$	II	$\frac{\pi}{3}$ or 60°	$\sqrt{3}$	$-\sqrt{3}$
3. cos $\frac{5\pi}{6}$	II	$\frac{\pi}{6}$ or 30°	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{2}$
4. sin $\frac{4\pi}{3}$	III	$\frac{\pi}{3}$ or 60°	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{2}$
5. cos 300	IV	60°	$\frac{1}{2}$	$\frac{1}{2}$

	sin	cos	tan
30	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$ or $\frac{1}{\sqrt{3}}$
45	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
60	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$