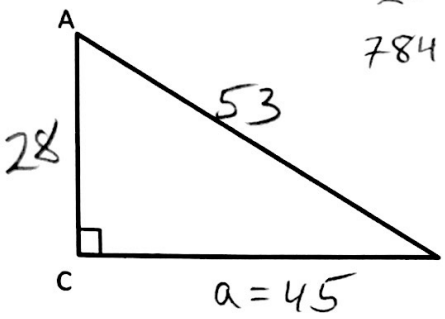
Geometry 3313 - Review 12.1-12.2 **Sine is Opposite over** Key

0. Given cos A = $^{28}/_{53}$. Find the 5 missing trigonometric ratios for ΔABC



$28^2 + a^2 = 53^2$

$784 + a^2 = 2809$

$a^2 = 2025$

$a = \sqrt{2025}$

$a = 45$

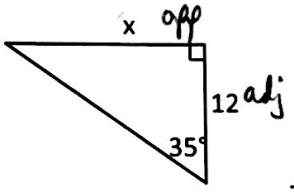
sin A = $^{45}/_{53}$ **sin B =** $^{28}/_{53}$

cos A = $^{28}/_{53}$ **cos B =** $^{45}/_{53}$

tan A = $^{45}/_{28}$ **tan B =** $^{28}/_{45}$

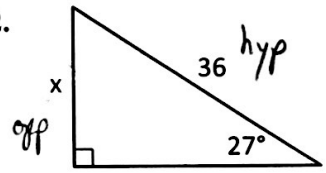
Write an equation that will allow us to solve for x. You do NOT need to solve the equation.

1.



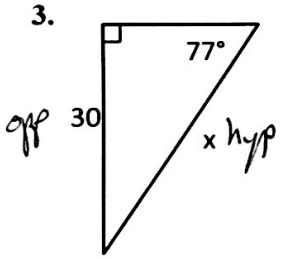
$\tan 35° = \frac{x}{12}$

2.



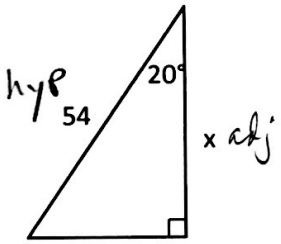
$\sin 27° = \frac{x}{36}$

3.



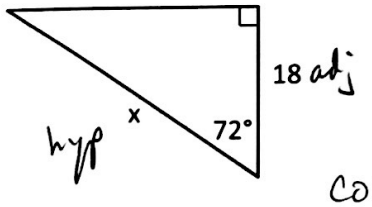
$\sin 77° = \frac{30}{x}$

4.



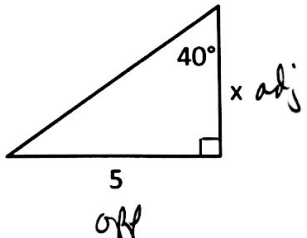
$\cos 20° = \frac{x}{54}$

5.



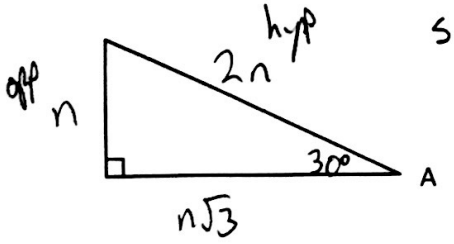
$\cos 72° = \frac{18}{x}$

6.



$\tan 40° = \frac{5}{x}$

7. The following triangle is a 30-60-90 right triangle, where $m\angle A = 30°$. Fill in the pattern for this special right triangle (we learned it in chapter 10). Use SOH-CAH-TOA to find sin A, then use your calculator to verify.



$\sin A = \frac{n}{2n} = \frac{1}{2}$

(SOH-CAH-TOA) Sin A = $\frac{n}{2n} = \frac{1}{2} = 0.5$

(Calculator) Sin A = 0.5

Solve each of the following equations. Round to the nearest tenth.

8. $\sin 42° = \frac{x}{50}$

$0.6691 = \frac{x}{50}$

$50(0.6691) = x$

$33.5 = x$

9. $\cos 22° = \frac{x}{36}$

$0.9272 = \frac{x}{36}$

$36(0.9272) = x$

$33.4 = x$

10. $\tan 63° = \frac{x}{29}$

$1.9626 = \frac{x}{29}$

$29(1.9626) = x$

$56.9 = x$

11. $\sin 42° = \frac{50}{x}$

$\frac{0.6691}{1} = \frac{50}{x}$

$0.6691x = 50$

$x = \frac{50}{0.6691}$

$x = 74.7$

12. $\cos 22° = \frac{36}{x}$

$\frac{0.9272}{1} = \frac{36}{x}$

$0.9272x = 36$

$x = \frac{36}{0.9272}$

$x = 38.8$

13. $\tan 63° = \frac{29}{x}$

$\frac{1.9626}{1} = \frac{29}{x}$

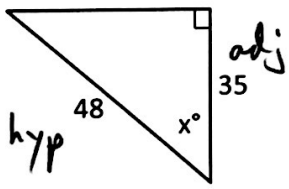
$1.9626x = 29$

$x = \frac{29}{1.9626}$

$x = 14.8$

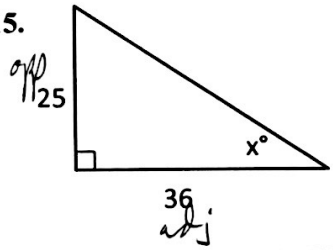
Write an equation that will allow us to solve for x. You do NOT need to solve the equation.

14.



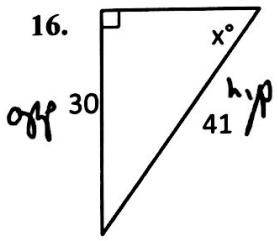
$\cos x = \frac{35}{48}$

15.



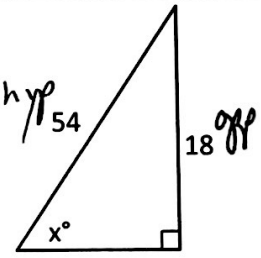
$\tan x = \frac{25}{36}$

16.



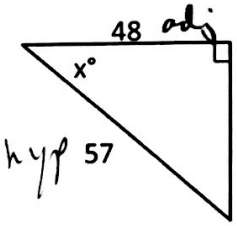
$\sin x = \frac{30}{41}$

17.



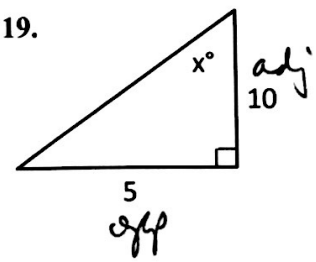
$\sin x = \frac{18}{54}$

18.



$\cos x = \frac{48}{57}$

19.



$\tan x = \frac{5}{10}$

Solve each of the following equations. Round to the nearest tenth

20. $\sin x = \frac{9}{13}$

$x = \sin^{-1}\left(\frac{9}{13}\right)$

$x = 48.3°$

21. $\cos x = \frac{25}{36}$

$x = \cos^{-1}\left(\frac{25}{36}\right)$

$x = 46.0°$

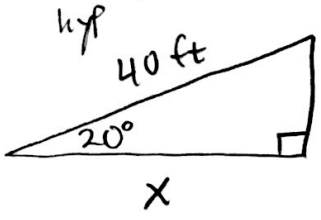
22. $\tan x = \frac{40}{33}$

$x = \tan^{-1}\left(\frac{40}{33}\right)$

$x = 50.5°$

The following problems are Free Response. SKETCH A MODEL of the described situation, write an equation, solve it, and answer the question. ROUND YOUR ANSWERS TO THE NEAREST TENTH.

23. A ramp inclines at a 20° angle. If the surface of the ramp is 40 feet long, what is the horizontal run of the ramp?



$\cos 20° = \frac{x}{40}$

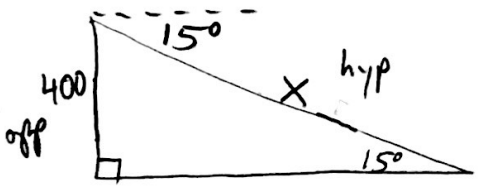
$0.9397 = \frac{x}{40}$

$40(0.9397) = x$

$x = 37.6$

Answer: 37.6 ft

24. The angle of depression from the light in a lighthouse to a boat out at sea is 15°. The ~~straight line~~ vertical distance from the boat to the light is 4,00 feet. What is the ~~vertical~~ straight line distance between the light and the boat?



$\sin 15° = \frac{400}{x}$

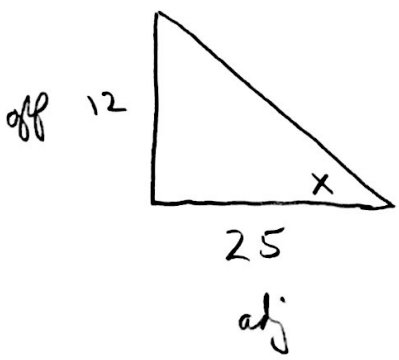
$\frac{0.2588}{1} = \frac{400}{x}$

$0.2588x = 400$

$x = \frac{400}{0.2588}$

Answer: 1545.6 ft

25. Find both acute angle measures in a right triangle whose legs are 12 feet and 25 feet.



$\tan x = \frac{12}{25}$

$x = \tan^{-1}\left(\frac{12}{25}\right)$

$x = 25.6°$

$90° - 25.6° = 64.4°$

Answer: 25.6° & 64.4°