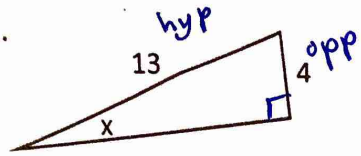
UNIT 3 HW 1

NAME key 2017

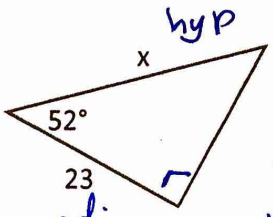
I. Right Triangle Trig – Find Missing Side or Angle Indicated

1. 

$\sin x = 4/13$

$x = \sin^{-1}(4/13)$

$x = 18°$

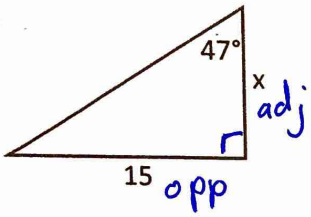
2. 

$\cos 52 = \frac{23}{x}$

$x\cos 52 = 23$

$x = \frac{23}{\cos 52}$

$x = 37.4$

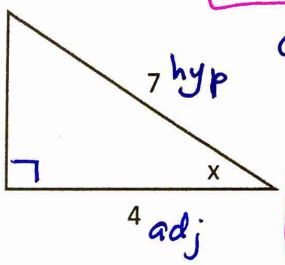
3. 

$\tan 47 = 15/x$

$x\tan 47 = 15$

$x = \frac{15}{\tan 47}$

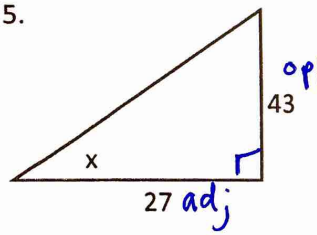
$x = 14$

4. 

$\cos x = 4/7$

$x = \cos^{-1}(4/7)$

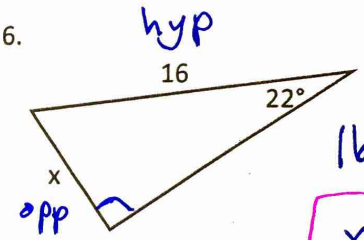
$x = 55°$

5. 

$\tan x = 43/27$

$x = \tan^{-1}(43/27)$

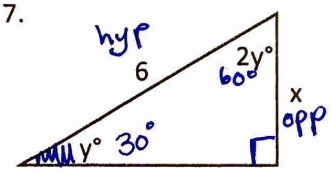
$x = 58°$

6. 

$\sin 22 = \frac{x}{16}$

$16\sin 22 = x$

$x = 6$

7. 

$y + 2y + 90 = 180$

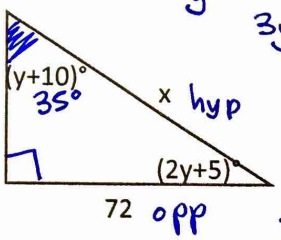
$3y = 90$

$y = 30°$

$\sin 30 = x/6$

$6\sin 30 = x$

$x = 3$

8. 

$y + 10 + 2y + 5 + 90 = 180$

$3y + 105 = 180$

$3y = 75$

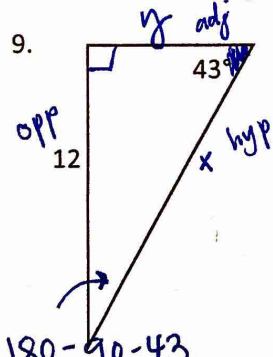
$y = 25$

$\sin 35° = \frac{x}{72}$

$72\sin 35 = x$

$x = 41.3$

II. Solve each triangle (find all missing angles and sides)

9. 

$\sin 43 = \frac{12}{x}$

$x\sin 43 = 12$

$x = \frac{12}{\sin 43} = 17.6$

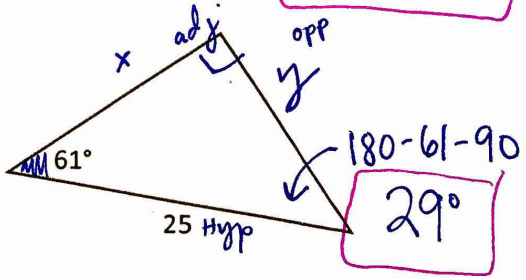
$\tan 43 = 12/y$

$y\tan 43 = 12$

$y = \frac{12}{\tan 43} = 12.9$

$180 - 90 - 43$

$47°$

10. 

$\sin 61 = \frac{y}{25}$

$25\sin 61 = y$

$y = 21.9$

$\cos 61 = \frac{x}{25}$

$25\cos 61 = x$

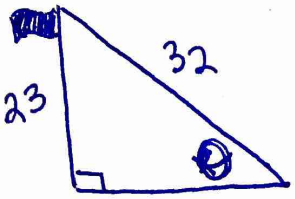
$x = 12.1$

$180 - 61 - 90$

$29°$

III. Angles of Elevation and Depression – Draw a picture and show your set-up.

11. A wire 32 feet long is attached to the top of a 23 foot long flagpole. Approximately what is the measure of the angle the wire makes with the ground? Round your answer to the nearest degree.

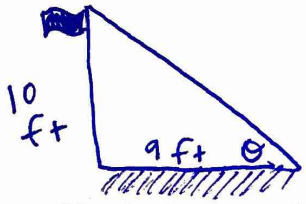


$\sin\theta = 23/32$

$\theta = \sin^{-1}(23/32)$

$\theta = 46^\circ$

12. When a 10 foot tall flagpole casts a 9 foot long shadow, what is the angle of elevation of the sun?

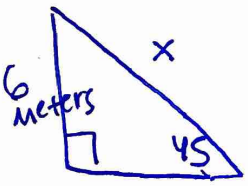


$\tan\theta = 10/9$

$\theta = \tan^{-1}(10/9)$

$\theta = 48^\circ$

13. A wire is attached to the top of a 6 meter tall telephone pole and forms a 45 degree angle with the ground. Exactly how long is the wire?



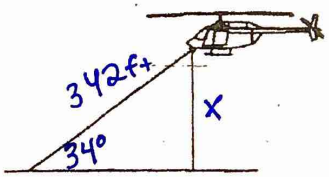
$\sin 45 = \frac{6}{x}$

$x\sin 45 = 6$

$x = 6/\sin 45$

$x = 8.5$ meters

14. The beam of a helicopter's searchlight makes an angle of 34 degrees with the ground. If the length of the beam is 342 feet, approximately how high is the helicopter above the ground? Round your answer to the nearest foot.

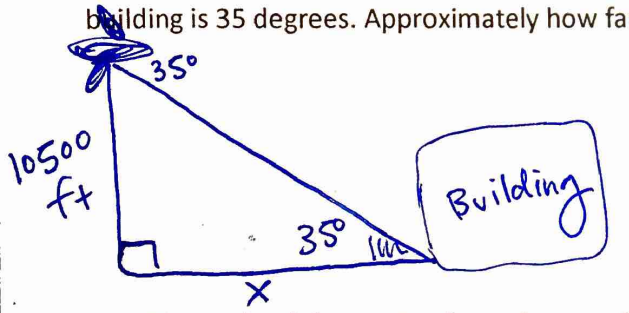


$\sin 34 = \frac{x}{342}$

$342\sin 34 = x$

$x = 191.2$ feet

15. An airplane is flying 10,500 feet above the level ground. The angle of depression from the plane to the base of the building is 35 degrees. Approximately how far horizontally must the plane fly to be directly over the building?



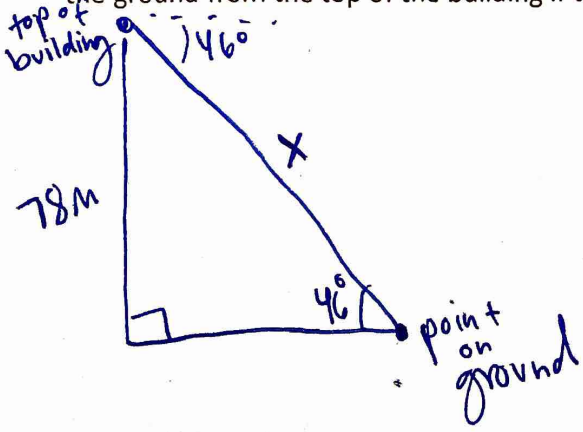
$\tan 35 = \frac{10500}{x}$

$x\tan 35 = 10500$

$x = \frac{10500}{\tan 35}$

$x = 14995.6$ feet

16. The angle of depression from the top of a building to a point on the ground is 46 degrees. How far is the point on the ground from the top of the building if the building is 78 meters high?



$\sin 46 = \frac{78}{x}$

$x\sin 46 = 78$

$x = \frac{78}{\sin 46}$

$x = 108.4$ meters