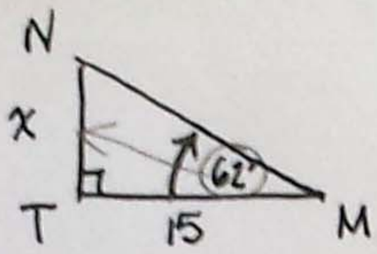
Geometry: Chapter 8 Review (Part 2)

1. Mary is standing 15 feet from the base of a tree. She sees a bird's nest in the tree and measures the **angle of elevation** from the ground to the nest at 62°. How high, to the nearest foot, is the nest above the ground?



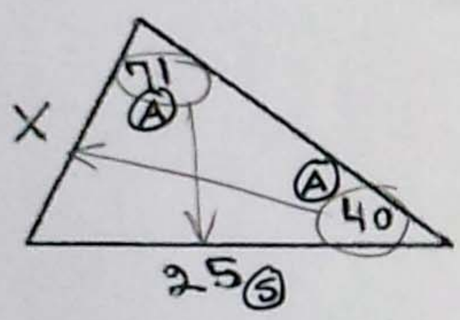
$\tan 62 = \frac{x}{15}$

$1.88 = \frac{x}{15}$

$\boxed{x \approx 28.21}$

2. Find x.

AAS → LAW of SINES



$\frac{\sin 71}{25} = \frac{\sin 40}{x}$

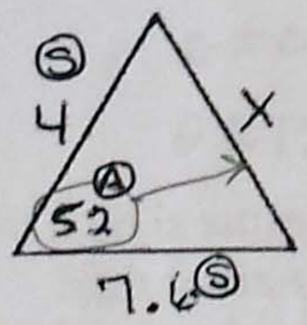
$x \sin 71 = 25 \sin 40$

$x = \frac{25 \sin 40}{\sin 71}$

$\boxed{x \approx 17}$

3. Find x.

SAS → LAW of COSINES

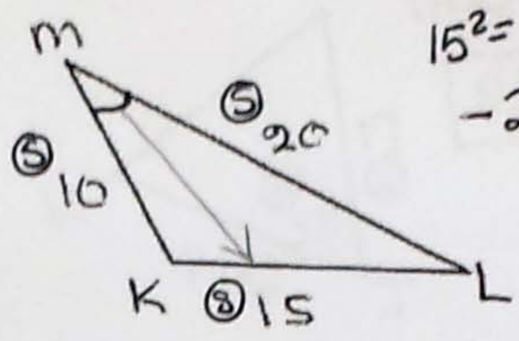


$x^2 = 4^2 + 7.6^2 - 2(4)(7.6)\cos 52$

$\boxed{x \approx 6.03}$

4. Find m∠M.

SSS → LAW of COSINES



$15^2 = 10^2 + 20^2 - 2(10)(20)\cos M$

$-275 = -400 \cos M$

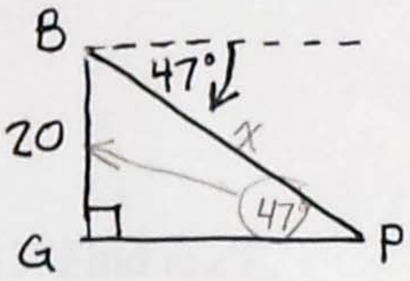
$\frac{275}{400} = \cos M$

$M = \cos^{-1}\left(\frac{275}{400}\right)$

$M \approx 46.57$

$\boxed{M \approx 47°}$

5. Jim is watching a parade from a 20 foot balcony. The **angle of depression** to the parade is 47°. What is the distance between Jim and the parade, to the nearest tenth of a foot? (Hint: hypotenuse)



$\sin 47 = \frac{20}{x}$

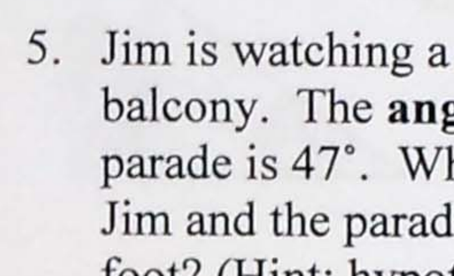
$0.73 = \frac{20}{x}$

$\boxed{x \approx 27.35}$

6. Find m∠A.

B

SSA → LAW of SINES



$\frac{\sin 50}{7} = \frac{\sin A}{5}$

$7 \sin A = 5 \sin 50$

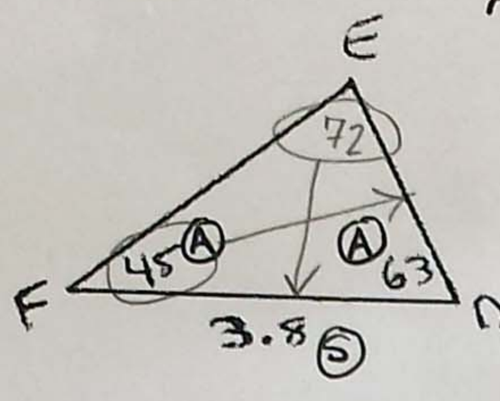
$\sin A = \frac{5 \sin 50}{7}$

$A = \sin^{-1}\left[\frac{5 \sin 50}{7}\right]$

$A \approx 33.17$

$\boxed{A \approx 33°}$

7. Find DE.



ASA → LAW of SINES

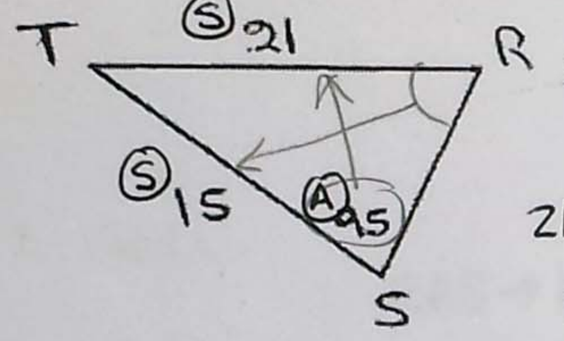
$\frac{\sin 72}{3.8} = \frac{\sin 45}{DE}$

$(DE)(\sin 72) = (3.8)(\sin 45)$

$DE = \frac{(3.8)(\sin 45)}{(\sin 72)}$

$DE \approx 2.83$

8. Find m∠R.



SSA → LAW of SINES

$\frac{\sin 95}{21} = \frac{\sin R}{15}$

$21 \sin R = 15 \sin 95$

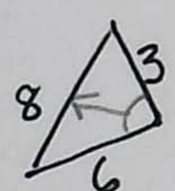
$\sin R = \frac{15 \sin 95}{21}$

$R = \sin^{-1}\left[\frac{15 \sin 95}{21}\right]$

$R \approx 45.36$

$R \approx 45°$

9. The edges of a triangular pillow for the couch measure 8", 3" and 6". What is the measure of the largest angle of the pillow to the nearest degree?



SSS → LAW of COSINES

$8^2 = 3^2 + 6^2 - 2(3)(6)\cos\theta$

$19 = -36\cos\theta$

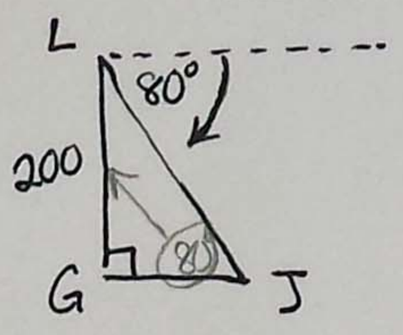
$\frac{19}{-36} = \cos\theta$

$\theta = \cos^{-1}\left(\frac{19}{-36}\right)$

$\theta \approx 121.86$

$\theta \approx 122°$

10. Leo is sitting in a seat on top of a 200 foot high ferris wheel looking down at his brother Jason. The **angle of depression** to Jason is 80°. How far is Jason from the base of the ferris wheel? Round to the nearest hundredth.

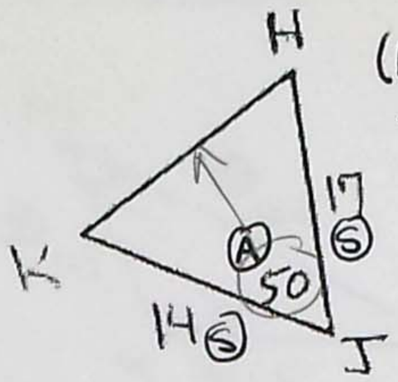


$TAN\,80 = \frac{200}{GJ}$

$5.67 = \frac{200}{GJ}$

$GJ \approx 35.27\,ft$

11. Find HK.

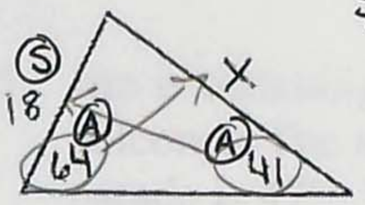


SAS → LAW of COSINES

$(HK)^2 = 14^2 + 17^2 - 2(14)(17)\cos 50$

$HK \approx 13.38$

12. Find x.



AAS → LAW of SINES

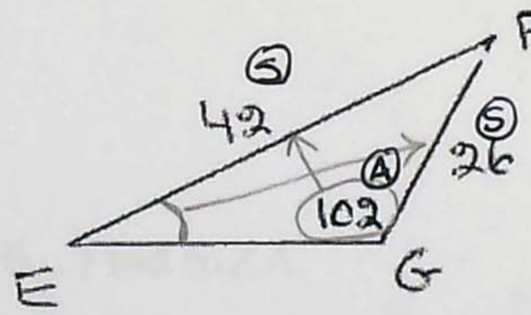
$\frac{\sin 64}{x} = \frac{\sin 41}{18}$

$x \sin 41 = 18 \sin 64$

$x = \frac{18 \sin 64}{\sin 41}$

$x \approx 24.66$

13. Find m∠E.



SSA → LAW of SINES

$\frac{\sin 102}{42} = \frac{\sin E}{26}$

$42 \sin E = 26 \sin 102$

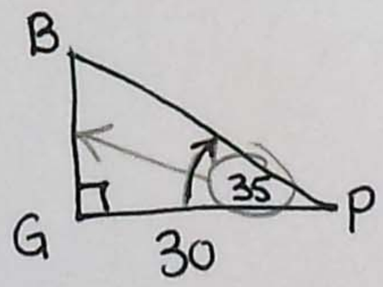
$\sin E = \frac{26 \sin 102}{42}$

$E = \sin^{-1}\left[\frac{26 \sin 102}{42}\right]$

$E \approx 37.27$

$E \approx 37°$

14. Bill is standing 30 m. from the base of a building. The **angle of elevation** to the top of the building is 35°. To the nearest meter, how tall is the building?



$TAN\,35 = \frac{BG}{30}$

$0.7 = \frac{BG}{30}$

$BG \approx 21.01\,m$