Geometry Unit 9: Trigonometry

Name Answers

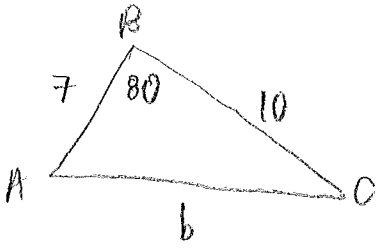
Learning Target 51 Homework

Period ___

/7

"I can use the Law of Cosines."

1) In ΔABC, AB = 7, BC = 10, and m∠B = 80. What is *b*? *Round to the nearest tenth.*



$b^2 = 7^2 + 10^2 - 2(7)(10)\cos 80$

$b^2 = 149 - 140\cos 80$

$b = \sqrt{149 - 140\cos 80} \approx \boxed{11.2}$

2) In ΔABC, AC = 15, BC = 12 and m∠C = 32. Ragnar solved for *c*. Explain his error in one to two complete sentences.

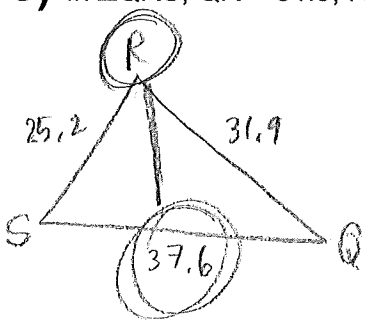
~~$C = 12^2 + 15^2 - 2(12)(15)\cos 32°$~~

~~$C = 369 - 360\cos 32°$~~

~~$C = 63.7$~~

Ragnar solved for c^2 not c. He forgot to square the c.

3) In ΔQRS, QR = 31.9, RS = 25.2, and QS = 37.6. What is m∠R? *Round to the nearest degree.*



$37.6^2 = 25.2^2 + 31.9^2 - 2(25.2)(31.9)\cos R$

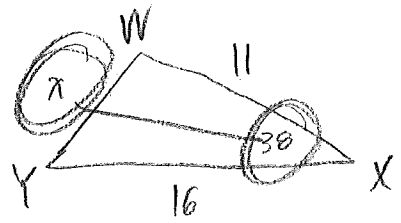
$1413.76 = 1652.65 - 1607.76\cos R$

$-1652.65 \quad -1652.65$

$\cos^{-1}\left(\frac{-238.89}{-1607.76}\right) = \cos^{-1}\left(\frac{-1607.76\cos R}{-1607.76}\right)$

$R = \cos^{-1}\left(\frac{238.89}{1607.76}\right) \approx \boxed{81°}$

4) In ΔWXY, m∠X = 38, WX = 11, and XY = 16. What is WY? *Round to the nearest tenth.*



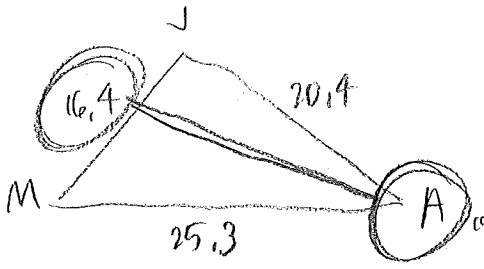
$x^2 = 11^2 + 16^2 - 2(11)(16)\cos 38$

$x^2 = 377 - 352\cos 38$

$x = \sqrt{377 - 352\cos 38}$

$\boxed{x \approx 10.0}$

5) In ΔAJM, AJ = 20.4, JM = 16.4, and AM = 25.3. What is m∠A? *Round to the nearest degree.*



$16.4^2 = 20.4^2 + 25.3^2 - 2(20.4)(25.3)\cos A$

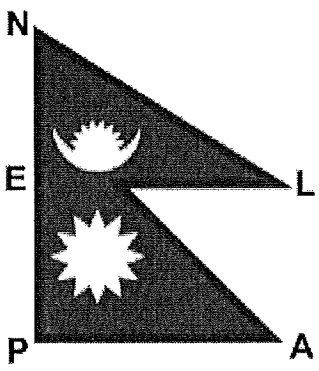
$268.96 = 1056.25 - 1032.24\cos A$

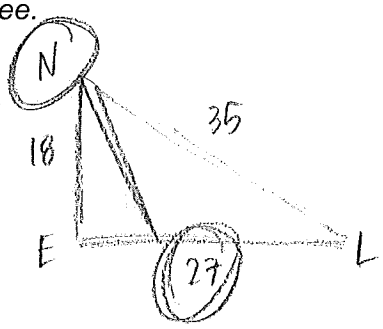
$-1056.25 \quad -1056.25$

$\cos^{-1}\left(\frac{-787.29}{-1032.24}\right) = \cos^{-1}\left(\frac{-1032.24\cos A}{-1032.24}\right)$

$A = \cos^{-1}\left(\frac{787.29}{1032.24}\right) \approx \boxed{40°}$

6) Nepal has the only non-rectangular country flag. NL = ~~27~~ 35 cm, LE = ~~35~~ 27 cm, and EN = 18 cm. What is m∠N? *Round to the nearest degree.*





$27^2 = 18^2 + 35^2 - 2(18)(35)\cos N$

$729 = 1549 - 1260\cos N$

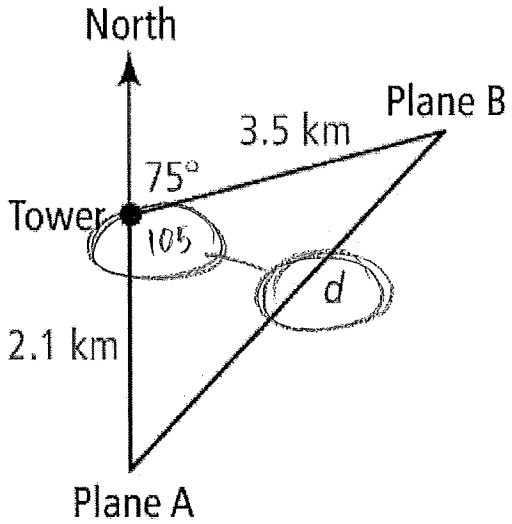
$-1549 \quad -1549$

$\frac{-820}{-1260} = \frac{-1260\cos N}{-1260}$

$\cos^{-1}\left(\frac{82}{126}\right) = \cos^{-1}(\cos N)$

$N = \cos^{-1}\left(\frac{82}{126}\right) \approx \boxed{49°}$

7) An air traffic controller is tracking a plane 2.1 kilometers due south of the radar tower. A second plane is located 3.5 kilometers from the tower at a heading of N 75° E (75° east of north). How far apart are the two planes? *Round to the nearest tenth of a kilometer.*



$d^2 = 2.1^2 + 3.5^2 - 2(2.1)(3.5)\cos 105$

$d^2 = 16.66 - 14.7\cos 105$

$d = \sqrt{16.66 - 14.7\cos 105}$

$\boxed{d \approx 4.5 \text{ km}}$