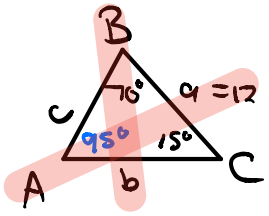
More Trig

Hw Review 10 Name_____

Use the law of sines or the law of cosines to answer each question. Round each angle to the nearest degree and each side to nearest tenth.

#1) In triangle ABC, a = 12, m∠B = 70°, m∠C = 15°. Find b.



$m\angle A + 70^\circ + 15^\circ = 180^\circ$

$m\angle A + 85^\circ = 180^\circ$

$m\angle A = 95^\circ$

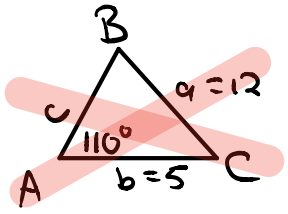
$\frac{\sin(95^\circ)}{12} = \frac{\sin(70^\circ)}{b}$

$b\sin(95^\circ) = 12\sin(70^\circ)$

$b = \frac{12\sin(70^\circ)}{\sin(95^\circ)}$

$b \approx 11.3$

#2) In triangle ABC, a = 12, b = 5, m∠A = 110°. Find m∠C.



$\frac{\sin(110^\circ)}{12} = \frac{\sin(m\angle B)}{5}$

$\frac{5\sin(110^\circ)}{12} = \sin(m\angle B)$

$\sin^{-1}\left(\frac{5\sin(110^\circ)}{12}\right) = m\angle B$

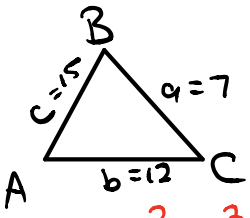
$23^\circ \approx m\angle B$

$m\angle C + 23^\circ + 110^\circ = 180^\circ$

$m\angle C + 133^\circ = 180$

$m\angle C = 47^\circ$

#3) In triangle ABC, a = 7, b = 12, c = 15. Find m∠C.



$c^2 = a^2 + b^2 - 2ab\cos(m\angle C)$

$(15)^2 = (7)^2 + (12)^2 - 2(7)(12)\cos(m\angle C)$

$225 = 49 + 144 - 168\cos(m\angle C)$

$225 = 193 - 168\cos(m\angle C)$

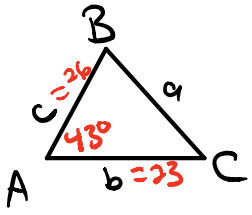
$32 = -168\cos(m\angle C)$

$\frac{-32}{168} = \cos(m\angle C)$

$\cos^{-1}\left(\frac{-32}{168}\right) = m\angle C$

$101^\circ \approx m\angle C$

#4) In triangle ABC, m∠A = 43°, b = 23, c = 26. Find a.



$a^2 = b^2 + c^2 - 2bc\cdot\cos(m\angle A)$

$a^2 = (23)^2 + (26)^2 - 2(23)(26)\cos(43^\circ)$

$a^2 = 529 + 676 - 1196\cos(43^\circ)$

$a^2 = 1205 - 1196\cos(43^\circ)$

$a = \pm\sqrt{1205 - 1196\cos(43^\circ)}$

$a \approx 18.2$

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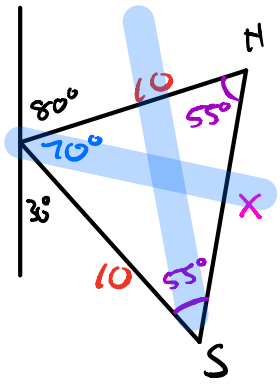
#5) Two of George's fleas leave George's body at the same time. Both fleas, Hoppy and Springs, travel at a speed of 2 feet per hour. Hoppy hops in the direction of 80° east of north while Springs springs 30° east of south. How far apart are the two fleas after 5 hours?



$80° + 30° + x = 180°$

$110° + x = 180°$

$x = 70°$

$D = rt$

$D = 2(5)$

$D = 10$

$70° + 2y = 180°$

$2y = 110°$

$y = 55°$

$$\frac{\sin(55°)}{10} = \frac{\sin(70°)}{X}$$

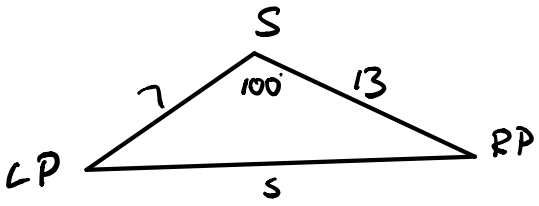
$$X \sin(55°) = 10 \sin(70°)$$

$$X = \frac{10 \sin(70°)}{\sin(55°)}$$

$$X \approx 11.5$$

Hoppy and Springs are about 11.5 feet apart.

#6) Strandy, one of George's arm pits hairs, decides to detach himself from the pit and make a run for it. While squirming across George's chest, Strandy is 7 inches from George's left armpit and 13 inches from his right armpit. The angle formed by the two armpits and Strandy is 100°. How many inches apart are George's armpits?



$s^2 = l^2 + r^2 - 2lr \cos(m\angle S)$

$s^2 = (13)^2 + (7)^2 - 2(13)(7)\cos(100°)$

$s^2 = 169 + 49 - 182\cos(100°)$

$s^2 = 218 - 182\cos(100°)$

$s = \pm\sqrt{218 - 182\cos(100°)}$

$s = 15.8$

George's armpits are 15.8 inches apart.

Answers

#1) b ≈ 11.3

#2) m∠C ≈ 47°

#3) m∠C ≈ 101°

#4) a ≈ 18.2