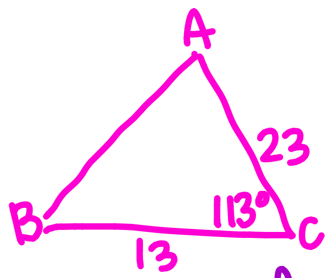
PreAP PreCalculus Unit 6 Law of Sines and Cosines

6.1 Law of Cosines Name KEY

Solve for the length of the missing side of each triangle. Round your answer to the nearest tenth.

1. $m\angle C = 113°$, $a = 13$, $b = 23$

$c = 30.5$



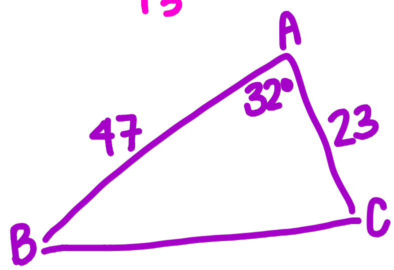
$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 13^2 + 23^2 - 2(13)(23)\cos 113°$

$\sqrt{c^2} \approx \sqrt{931.657}$

2. $m\angle A = 32°$, $b = 23$, $c = 47$

$a = 30.1$



$a^2 = b^2 + c^2 - 2bc\cos A$

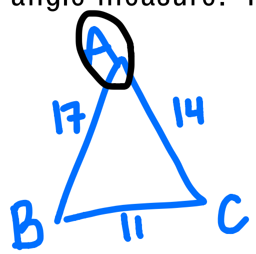
$a^2 = 23^2 + 47^2 - 2(23)(47)\cos 32°$

$\sqrt{a^2} \approx \sqrt{904.520}$

Solve each triangle for the specified angle measure. Round your answer to the nearest degree.

3. $a = 11$, $b = 14$, $c = 17$; $m\angle A$

$m\angle A = 40°$



$a^2 = b^2 + c^2 - 2bc\cos A$

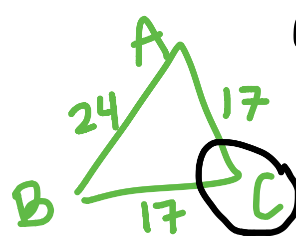
$11^2 = 14^2 + 17^2 - 2(14)(17)\cos A$

$-364 = -476\cos A$

$\cos^{-1}\left(\frac{364}{476}\right) = m\angle A$

4. $a = 17$, $b = 17$, $c = 24$; $m\angle C$

$m\angle C = 90°$



$c^2 = a^2 + b^2 - 2ab\cos C$

$24^2 = 17^2 + 17^2 - 2(17)(17)\cos C$

$-2 = -578\cos C$

$\cos^{-1}\left(\frac{2}{578}\right) = m\angle C$

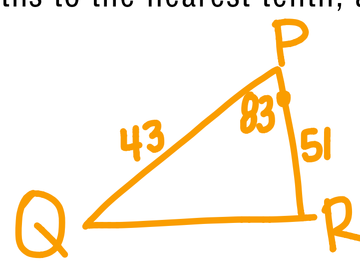
Solve each ΔPQR. Round lengths to the nearest tenth, and angles to the nearest degree.

5. $m\angle P = 83°$, $r = 43$, $q = 51$

$m\angle Q = 54°$

$m\angle R = 43°$

$p = 62.6$



$p^2 = q^2 + r^2 - 2rq\cos P$

$p^2 = 51^2 + 43^2 - 2(51)(43)\cos 83°$

$p^2 = 3915.481$

$r^2 = p^2 + q^2 - 2pq\cos R$

$43^2 = (62.6)^2 + 51^2 - 2(62.6)(51)\cos R$

$\cos^{-1}\left(\frac{4670.76}{6385.2}\right) = m\angle R$

$m\angle Q = 180 - 43° - 83°$

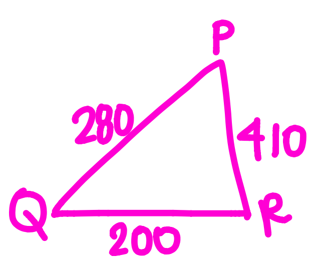
6. $p = 200$, $q = 410$, $r = 280$

$m\angle P = 26°$

$m\angle Q = 116°$

$m\angle R = 38°$

$180 - 116 - 26$



$p^2 = q^2 + r^2 - 2qr\cos P$

$200^2 = 410^2 + 280^2 - 2(410)(280)\cos P$

$\cos^{-1}\left(\frac{206500}{229600}\right) = m\angle P$

$q^2 = p^2 + r^2 - 2pr\cos Q$

$410^2 = 200^2 + 280^2 - 2(200)(280)\cos Q$

$\cos^{-1}\left(-\frac{49700}{112000}\right) = m\angle Q$