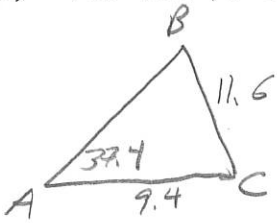
Law of Sines/Law of Cosines Ad majorem Dei gloriam Accelerated Algebra 2 / Precalculus
Mr. Reis

Name KEY

1. Solve each triangle, including finding its area.

(a) $\measuredangle A = 37.4°, a = 11.6, b = 9.4$



$\frac{\sin 37.4}{11.6} = \frac{\sin B}{9.4}$

$\sin B = \frac{9.4 \sin 37.4}{11.6}$

$B \approx 29.484°$ or $150.516°$ invalid

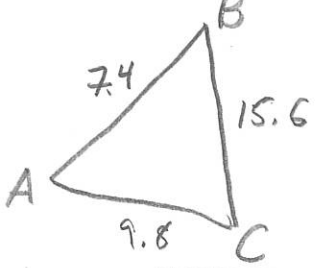
$C \approx 113.116°$

$\frac{\sin 37.4}{11.6} = \frac{\sin 113.116}{c}$

$c = \frac{11.6 \sin 113.116}{\sin 37.4}$

$c \approx 17.565$

(b) $a = 15.6, b = 9.8, c = 7.4$



$15.6^2 = 7.4^2 + 9.8^2 - 2(7.4)(9.8)\cos A$

$92.56 = -145.04 \cos A$

$A = \cos^{-1}\left(\frac{-92.56}{145.04}\right) \approx 129.655°$

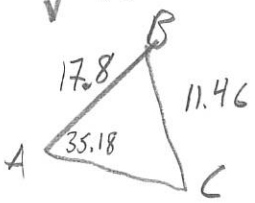
$7.4^2 = 15.6^2 + 9.8^2 - 2(15.6)(9.8)\cos C$

$-284.64 = -305.76 \cos C$

$\angle C = \cos^{-1}\left(\frac{284.64}{305.76}\right) \approx 21.420°$

$\angle B \approx 28.925°$

(c) $\measuredangle A = 35.18, c = 17.8, a = 11.46$



$\frac{\sin 35.18}{11.46} = \frac{\sin C}{17.8}$

$C = \sin^{-1}\left(\frac{17.8 \sin 35.18}{11.46}\right)$

$C \approx 63.494°$ or $116.506°$

$B \approx 81.326°$ or $28.314°$

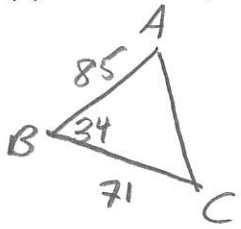
$\frac{\sin 81.326}{b} = \frac{\sin 35.18}{11.46}$

$b \approx 19.663$

$\frac{\sin 28.314}{b} = \frac{\sin 35.18}{11.46}$

$b \approx 9.434$

(d) $\measuredangle A = 34°, b = 71, c = 85$



$b^2 = 85^2 + 71^2 - 2(85)(71)\cos(34)$

$b \approx 47.534$

$\frac{\sin A}{71} = \frac{\sin 34}{47.534}$

$A = \sin^{-1}\left(\frac{71 \sin 34}{47.534}\right)$

$A \approx 56.642°$

$C \approx 89.358°$