Name: _____ Hour: _____

Law of Cosines Solving for a Triangle

Notes:

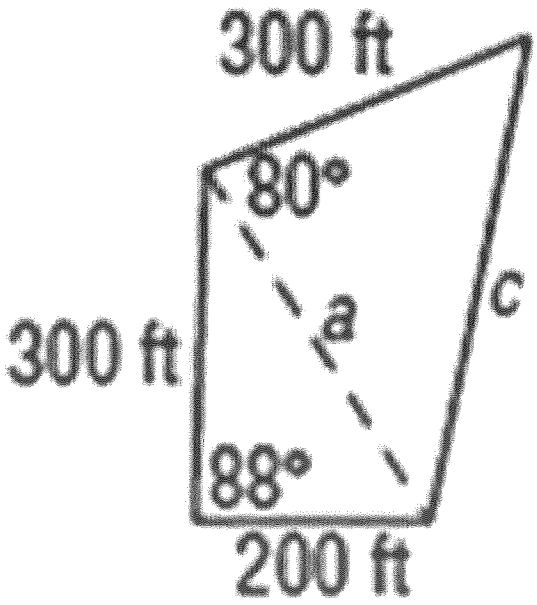
Directions: Round to the nearest tenth if needed.

1. If a = 24, b = 18, and c = 16. Solve the triangle.

2. If p=41cm, q= 36cm, and <R = 49°, solve the triangle.

Name: _____ Hour: _____

3. **Example** **Ms. Jones wants to purchase a piece of land with the shape shown. Find the perimeter of the property.**



Name: Key Hour: _____

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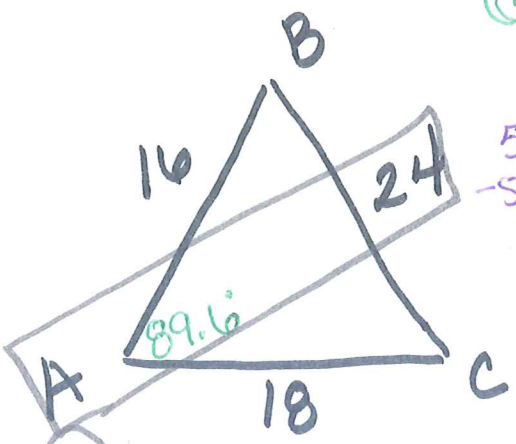


① Find $\angle A$

$24^2 = 16^2 + 18^2 - 2 \cdot 16 \cdot 18 \cos A$

$576 = 580 - 576 \cos A$

$-580 \quad -580$

$\frac{-4}{-576} = \frac{-576 \cos A}{-576}$

$\cos A = \frac{-4}{-576}$

$\angle A = \cos^{-1}\left(\frac{-4}{-576}\right)$

$\angle A \approx 89.6°$

② Find $\angle B$

$\frac{\sin B}{18} = \frac{\sin(89.6)}{24}$

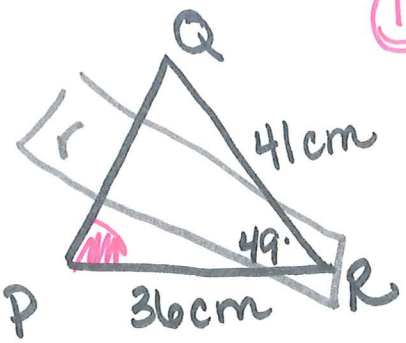
$\sin B = \frac{18 \sin(89.6)}{24}$

$\angle B = \sin^{-1}\left(\frac{18 \sin(89.6)}{24}\right)$

$\angle B = 48.6°$

③ $\angle C = 41.8°$ by Δ sum

4. If p=41cm, q= 36cm, and $\angle R = 49°$, solve the triangle.



① $r^2 = 41^2 + 36^2 - 2 \cdot 41 \cdot 36 \cos(49°)$

$r^2 = 1040.314$

$r = \sqrt{1040.314}$

$r \approx 32.3$

② Find $\angle P$

$\frac{\sin P}{41} = \frac{\sin(49)}{32.3}$

$\sin P = \frac{41 \sin(49)}{32.3}$

$\angle P = \sin^{-1}\left(\frac{41 \cdot \sin(49)}{32.3}\right)$

$\angle P \approx 73.3°$

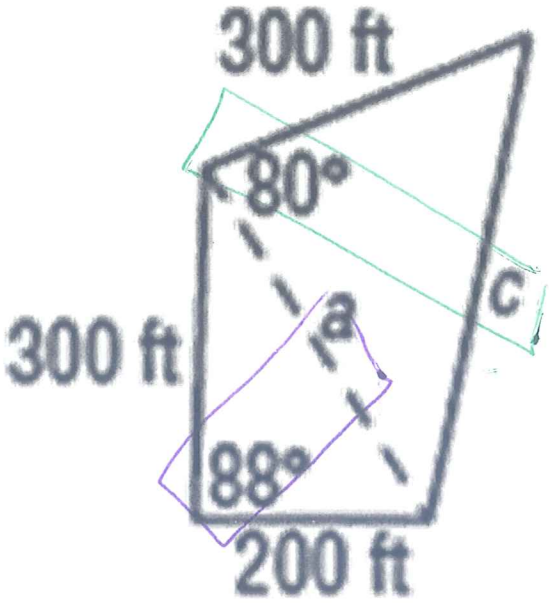
Find $\angle Q$

Δ sum

$\angle Q = 57.7°$

Name: _____ Hour: _____

5 **Example** **Ms. Jones wants to purchase a piece of land with the shape shown. Find the perimeter of the property.**



Find a 1st

$a^2 = 300^2 + 200^2 - 2 \cdot 300 \cdot 200 \cos(88)$

$a^2 = 125{,}812.060$

$a = 354.7 ft$

Law of Cosines again :

$c^2 = 354.7^2 + 300^2 - 2 \cdot 354.7 \cdot 300 \cos(80)$

$c^2 = 178856.285$

$c = 422.9 ft$

Remember the question asks what is the Perimeter of the property.

$P = 200 + 300 + 300 + 422.9$

$P = 1222.9 ft$