1. Solve ΔABC. Let $\angle A = 47°, a = 11, and\ b = 5$.
   a. Use Law of Sines to determine $\angle B$.

$$\frac{\sin 47}{11} = \frac{\sin B}{5}$$

$$\vdots$$

$$\boxed{B \approx 19.4}$$

   b. Use sum of the triangle's angles theorem to find $\angle C$.

$$\angle C = 180 - \angle A - \angle B$$

$$\vdots$$

$$\boxed{\angle C \approx 113.6}$$

   c. Use Law of Sines to determine side c.

$$\frac{\sin 47}{11} = \frac{\sin 113.58345\ldots}{c}$$

$$\vdots$$

$$\boxed{c \approx 13.8}$$

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2. Solve ΔXYZ. Let $\angle Y = 33°, x = 18.5, and\ z = 12$.
   a. Use Law of Cosines to determine side y.

$$y^2 = 18.5^2 + 12^2 - 2 \cdot 18.5 \cdot 12 \cos 33$$

$$\vdots$$

$$\boxed{y \approx 10.7}$$

   b. Use Law of Sines to determine $\angle X$.

$$\frac{\sin 33}{10.67147} = \frac{\sin X}{18.5}$$

$$\vdots$$

$$\boxed{\angle X \approx 70.8°}$$

   c. Use sum of the triangle's angles theorem to find $\angle Z$.

$$\angle Z = 180 - \angle X - \angle Y$$

$$\vdots$$

$$\boxed{\angle Z \approx 76.2}$$

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3. Solve ΔKLM. Let $\angle M = 122°, \angle L = 25°, and\ k = 97$.

① Find $\angle K$.

$\angle K = 180 - 122 - 25 = \boxed{33°}$

② Find m.

$$\frac{\sin 33}{97} = \frac{\sin 122}{m}$$

$\vdots$

$\boxed{m \approx 151.0}$

③ Find ℓ.

$$\frac{\sin 25}{\ell} = \frac{\sin 122}{97}$$

$\vdots$

$\boxed{\ell \approx 48.3}$

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4. Solve ΔGAP. Let $g = 3, a = 4, and\ p = 5$.

Hint: Find angle P first by Law of Cosines

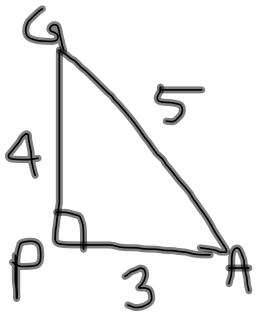
① $\angle P$

$5^2 = 4^2 + 3^2 - 2 \cdot 4 \cdot 5 \cos P$

$\vdots$

$\boxed{\angle P = 90°}$

②



$\tan A = \frac{4}{3}$

$\vdots$

$\boxed{\angle A \approx 53.1°}$

③ $180 - 90 - \angle A$

$\vdots$

$\boxed{\angle G \approx 36.9}$

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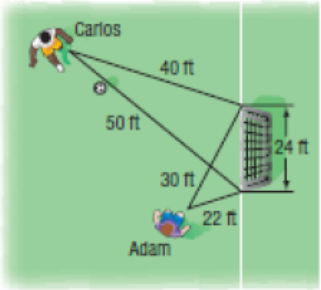
5.

SOCCER Carlos and Adam are playing soccer. Carlos is standing 40 feet from one post of the goal and 50 feet from the other post. Adam is standing 30 feet from one post of the goal and 22 feet from the other post. If the goal is 24 feet wide, which player has a greater angle to make a shot on goal? Adam



Carlos

$24^2 = 50^2 + 40^2 - 2 \cdot 50 \cdot 40 \cos C$

$\vdots$

$\boxed{\angle C \approx 28.2^\circ}$

Adam

$24^2 = 30^2 + 22^2 - 2 \cdot 30 \cdot 22 \cos A$

$\vdots$

$\boxed{\angle A \approx 52.3^\circ}$ ☆

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