

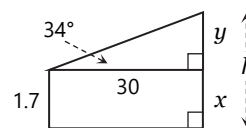
**LESSON 86** .....

- $\angle G \cong \angle G$  by the Reflexive Property.  
 $\angle E \cong \angle HFG$  because  $m\angle HFG = 180 - 130 = 50^\circ$ .  
 So,  $\triangle DEG \sim \triangle HFG$  by AA.
- $\angle B \cong \angle B$  by the Reflexive Property.  
 $\angle BAC \cong \angle D$  because  $m\angle BAC = 180 - 37 - 93 = 50^\circ$ .  
 So,  $\triangle BAC \sim \triangle BDA$  by AA.
- $\angle KML \cong \angle OMN$  as vertical angles.  
 $KM/OM = 55/75 = 11/15$   
 $LM/NM = 50/70 = 5/7$   
 So, the triangles are not similar.
- $PQ/XY = 12/20 = 3/5$   
 $QR/YZ = 9/15 = 3/5$   
 $PR/XZ = 15/25 = 3/5$   
 So,  $\triangle PQR \sim \triangle XYZ$  by SSS.
- Use the Leg Rule.  $6^2 = 3(3 + x)$   
 $x = 9$
- Use the Altitude Rule.  $8^2 = x(4x)$   
 $x^2 = 16$   
 $x = 4$
- Use Theorem 70.1.  $\frac{4}{x} = \frac{15}{18}$   
 $15x = 4(18)$   
 $x = 24/5$
- Use Theorem 69.2.  $\frac{8}{6x} = \frac{5x}{15}$   
 $(6x)(5x) = 8(15)$   
 $x^2 = 4$   
 $x = 2$
- Statements (Reasons)
  - midsegment  $\overline{BC}$  (Given)
  - $\overline{BC} \parallel \overline{DE}$  (A midsegment is parallel to the 3rd side.)
  - $\angle ABC \cong \angle D$  (Corresponding  $\angle$ s on  $\parallel$  lines are  $\cong$ .)
  - $\angle A \cong \angle A$  (Reflexive Property)
  - $\triangle ABC \sim \triangle ADE$  (AA)
  - $\frac{AB}{AD} = \frac{AC}{AE}$  (Corresponding sides of similar triangles are proportional.)
- $\frac{20}{135} = \frac{24}{x} \rightarrow 20x = 135(24) \rightarrow x = 162$  m
- $AD/AB = AE/AC = 1/3$   
 $\angle A \cong \angle A$  by the Reflexive Property.  
 So,  $\triangle ADE \sim \triangle ABC$  by SAS.  
 Corresponding sides are proportional.  
 $DE/BC = 1/3; BC = 3DE = 3(15) = 45$  ft  
 So, the pond is 45 feet wide.
- $x^2 = 3^2 + 6^2$   
 $x^2 = 45$   
 $x = 3\sqrt{5}$
- $11^2 = 9^2 + x^2$   
 $x^2 = 40$   
 $x = 2\sqrt{10}$
- right;  $10^2 = 8^2 + 6^2$
- obtuse;  $(5\sqrt{6})^2 > 5^2 + 11^2$

- $a = 7\sqrt{3}$   
 $b = 2(7) = 14$
- $\sin 30^\circ = \frac{1}{2}$      $\cos 30^\circ = \frac{\sqrt{3}}{2}$      $\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
- $a^\circ$  and  $b^\circ$  are complementary. The cosine of an acute angle is equal to the sine of its complement.  
 $\cos b^\circ = \sin a^\circ = 2/5$
- $AC = \sqrt{14^2 - 12^2} = \sqrt{52} \approx 7.2$   
 $m\angle A = \sin^{-1}(12/14) \approx 59^\circ$   
 $m\angle B \approx 90 - 59 = 31^\circ$
- $BC = 8 \sin 62^\circ \approx 7.1$   
 $AC = 8 \cos 62^\circ \approx 3.8$   
 $m\angle B = 90 - 62 = 28^\circ$
- area =  $(1/2)(19)(15) \sin 40^\circ \approx 91.6$
- included angle =  $180 - 68 = 112^\circ$   
 area =  $(12)(16) \sin 112^\circ \approx 178$

24 ~ 25. Diagrams are not drawn to scale.

- $x = 1.7$   
 $y = 30 \tan 34^\circ \approx 20.2$   
 $h = x + y \approx 21.9$   
 The tree is about 21.9 m tall.



- $\theta = 15^\circ$   
 $x = 56 / \tan 15^\circ \approx 209$   
 The boat is about 209 ft away from the lighthouse.

