3.7 Cosine Law

For non-right triangles that can’t be solved with the sine law

<table>
<thead>
<tr>
<th>SAS</th>
<th>SSS</th>
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Cosine Law can be proven based on the _______________ Theorem
Example #1:

Example #2:
Assignment:

1a) Find the unknown side length

2a) Find the indicated angle

1b) Find the unknown side length

2b) Find the indicated angle
<table>
<thead>
<tr>
<th>3a) Sketch the triangle and find the unknown</th>
<th>3b) Sketch the triangle and find the unknown</th>
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</thead>
<tbody>
<tr>
<td>( w^2 = 15^2 + 16^2 - 2(15)(16)\cos 75° )</td>
<td>( 48^2 = 46^2 + 45^2 - 2(46)(45)\cos G )</td>
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<tr>
<th>4a) Solve the triangle:</th>
<th>4b) Solve the triangle:</th>
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<tr>
<td>In ( \triangle DEF ), ( d = 5.0 , cm ), ( e = 6.5 , cm ), and ( \angle F = 65° )</td>
<td>In ( \triangle LMN ), ( l = 5.5 , cm ), ( m = 4.6 , cm ), and ( n = 3.3 , cm )</td>
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</table>
Answer Key
1) a) 6.9 cm  b) 14.7 cm 
2) a) 35.7  b) 74 
3) a) 

\[ \begin{align*} 
&\text{w = 18.9} \\
\end{align*} \]

b) 

\[ \begin{align*} 
\angle Y &= 63.7^\circ \\
\end{align*} \]

4) a) \( f = 6.3 \text{ cm}, \angle D = 45.9^\circ, \angle E = 69.1^\circ \)

b) \( \angle L = 86.6^\circ, \angle M = 56.6^\circ, \angle N = 36.8^\circ \)
Practice Quiz

1) Use the Cosine Law to find the measure of side $a$.

2) Use the Cosine Law to find the measure of angle $A$.

Answers: 1) 13 cm 2) 72°