## Types of triangles

<table>
<thead>
<tr>
<th>Types</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACUTE</td>
<td></td>
</tr>
<tr>
<td>OBTUSE</td>
<td></td>
</tr>
<tr>
<td>RIGHT</td>
<td></td>
</tr>
<tr>
<td>SCALENE</td>
<td></td>
</tr>
<tr>
<td>ISOSCELES</td>
<td></td>
</tr>
<tr>
<td>EQUILATERAL</td>
<td></td>
</tr>
</tbody>
</table>

### Isosceles Triangle Theorem

**Theorem**
If two sides of a triangle are congruent, then

**If**...

**Then**...

### Converse of the Isosceles Triangle Theorem

**Theorem**
If two angles of a triangle are congruent, then

**If**...

**Then**...
### Equilateral Triangle Theorem

<table>
<thead>
<tr>
<th>Theorem</th>
<th>If…</th>
<th>Then…</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a triangle is equilateral, then</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Converse of the Equilateral Triangle Theorem

<table>
<thead>
<tr>
<th>Theorem</th>
<th>If…</th>
<th>Then…</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a triangle is equiangular, then</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Congruent Figures -

### Corresponding Parts -

#### Example #1

\[ \triangle EFG \cong \triangle XZY \]

#### Example #2

<table>
<thead>
<tr>
<th>[ \triangle RST \cong \triangle TRG ]</th>
<th>[ \triangle ZXY \cong \triangle ZXJ ]</th>
<th>[ \triangle LMN \cong \triangle IHN ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \overline{YZ} \cong ? ]</td>
<td>[ \overline{SR} \cong ? ]</td>
<td>[ \angle MNL \cong ? ]</td>
</tr>
</tbody>
</table>

### Try it!


4.1 PRACTICE

Draw the following. Mark the picture!!!

1. Obtuse Isosceles Triangle
2. Acute Equilateral Triangle
3. Right Scalene Triangle

Find x.

4.

5.

6.

7.

8.

9.

Mark the angles and sides of each pair of triangles to indicate that they are congruent.

10. $\triangle GHF \cong \triangle GHL$
11. $\triangle CBD \cong \triangle JKL$
12. $\triangle WXY \cong \triangle DCY$
Write a statement indicating that the triangle pair is congruent. ORDER IS IMPORTANT!!!


Complete each congruence statement.

16. \( \triangle SUT \cong \triangle SCE \)

17. \( \triangle VWX \cong \triangle VLM \)

18. \( \triangle HGI \cong \triangle HGW \)

\( \angle U \cong ? \)

\( \overline{WX} \cong ? \)

\( \overline{GI} \cong ? \)

<table>
<thead>
<tr>
<th>ALGEBRA REVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOLVE</strong></td>
</tr>
<tr>
<td>( 2(3x - 4) - 5 = -7 )</td>
</tr>
<tr>
<td>( \frac{x}{5} = \frac{x + 2}{15} )</td>
</tr>
<tr>
<td><strong>GRAPH</strong></td>
</tr>
<tr>
<td>( y = \frac{3}{4}x )</td>
</tr>
<tr>
<td>( y = x )</td>
</tr>
<tr>
<td><strong>MULTIPLY</strong></td>
</tr>
<tr>
<td>( (2x - 3)(x + 3) )</td>
</tr>
<tr>
<td><strong>FACTOR</strong></td>
</tr>
<tr>
<td>( x^2 - 4x - 12 )</td>
</tr>
</tbody>
</table>
4.1 APPLICATION

1. Mark the picture.

\[ \triangle CBA \cong \triangle CWX \]

2. Given \( \angle T = x^2 \) and \( \angle I = 3x + 18 \). Find \( x \).

Watch the application walk through video if you need extra help getting started!

In order to prove that two triangles are congruent, you must show that every corresponding angle and every corresponding side is congruent.

3. Mark the picture and then prove it. Show ALL SIDES and ALL ANGLES \( \cong \) !!!

Given: \( GI \parallel TR \)

- \( H \) is the midpoint of \( GT \)
- \( GI \cong RT \)
- \( HR \cong IH \)

Prove: \( \triangle GHI \cong \triangle THR \)

<table>
<thead>
<tr>
<th>STATEMENTS</th>
<th>REASONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( GI \parallel TR )\n  ( H ) is the midpoint of ( GT )\n  ( GI \cong RT )\n  ( HR \cong IH )</td>
<td>1.</td>
</tr>
<tr>
<td>2. ( GH \cong HT )</td>
<td>2.</td>
</tr>
<tr>
<td>3. ( \angle G \cong \angle T )</td>
<td>3. Alternate Interior Angles are congruent</td>
</tr>
<tr>
<td>4. ( \angle I \cong \angle R )</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
</tr>
<tr>
<td>6. ( \triangle GHI \cong \triangle THR )</td>
<td>6. Definition of Congruent Triangles</td>
</tr>
</tbody>
</table>
Given: \( \triangle VXW \) is an isosceles triangle with base \( VW \)
\( XP \) is an angle bisector of \( \angle VXW \)
P is the midpoint of \( VW \)
\( \angle VPX \cong \angle WPX \)

Prove: \( \triangle PVX \cong \triangle PWX \)

<table>
<thead>
<tr>
<th>STATEMENTS</th>
<th>REASONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \triangle VXW ) is an isosceles triangle ( VP ) is an angle bisector of ( \angle VXW ) ( P ) is the midpoint of ( VW ) ( \angle VPX \cong \angle WPX )</td>
<td>1.</td>
</tr>
<tr>
<td>2. ( VP \cong XP )</td>
<td>2.</td>
</tr>
<tr>
<td>3. ( VX \cong WX )</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
<tr>
<td>5. ( \angle VPX \cong \angle WPX )</td>
<td>5.</td>
</tr>
<tr>
<td>6. ( \angle XVP \cong \angle XWP )</td>
<td>6.</td>
</tr>
<tr>
<td>7. ( \triangle PVX \cong \triangle PWX )</td>
<td>7.</td>
</tr>
</tbody>
</table>

5. Fill in the measure of every angle:

GIVEN:

\[ m\angle KAB = 148^\circ \]
\[ m\angle EOF = 45^\circ \]
\[ m\angle DEF = 65^\circ \]
\[ m\angle ODE = 145^\circ \]
\[ m\angle JFH = 122^\circ \]

Name any isosceles triangles.