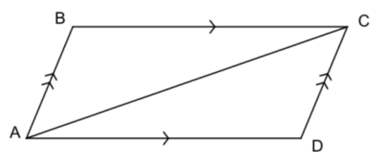
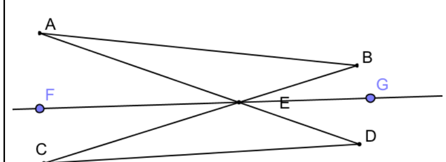
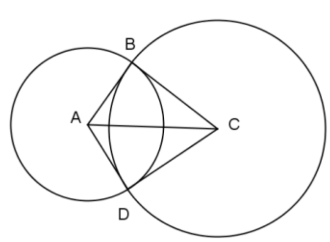
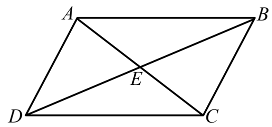
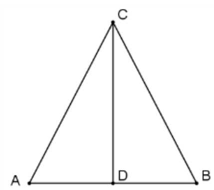
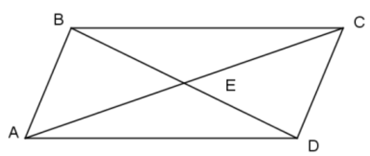
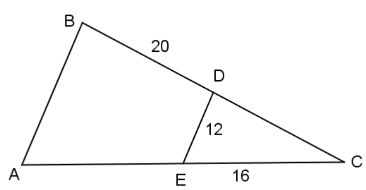
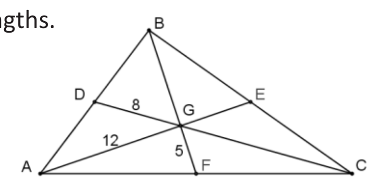
# Lesson 34: Review of the Assumptions

## Classwork

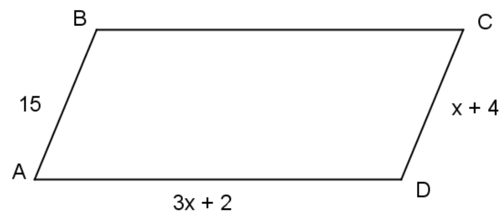
| Assumption/Fact/Property | Guiding Questions/Applications | Notes/Solutions |
|---|---|---|
| Given two triangles $\triangle ABC$ and $\triangle A'B'C'$ so that $AB = A'B'$ (Side), $\text{m}\angle A = \text{m}\angle A'$ (Angle), $AC = A'C'$(Side), then the triangles are congruent.<br><br>[SAS] | The figure below is a parallelogram $ABCD$. What parts of the parallelogram satisfy the SAS triangle congruence criteria for $\triangle ABD$ and $\triangle CDB$? Describe a rigid motion(s) that will map one onto the other. (Consider drawing an auxiliary line.)<br> | |
| Given two triangles $\triangle ABC$ and $\triangle A'B'C'$, if $\text{m}\angle A = \text{m}\angle A'$ (Angle), $AB = A'B'$ (Side), and $\text{m}\angle B = \text{m}\angle B'$ (Angle), then the triangles are congruent.<br><br>[ASA] | In the figure below, $\triangle CDE$ is the image of the reflection of $\triangle ABE$ across line $FG$. Which parts of the triangle can be used to satisfy the ASA congruence criteria?<br> | |
| Given two triangles $\triangle ABC$ and $\triangle A'B'C'$, if $AB = A'B'$ (Side), $AC = A'C'$ (Side), and $BC = B'C'$ (Side), then the triangles are congruent.<br><br>[SSS] | $\triangle ABC$ and $\triangle ADC$ are formed from the intersections and center points of circles $A$ and $C$. Prove $\triangle ABC \cong \triangle ADC$ by SSS.<br> | |

| | | |
|---|---|---|
| Given two triangles, $\triangle ABC$ and $\triangle A'B'C'$, if $AB = A'B'$ (Side), $m\angle B = m\angle B'$ (Angle), and $\angle C = \angle C'$ (Angle), then the triangles are congruent.<br><br>[AAS] | The AAS congruence criterion is essentially the same as the ASA criterion for proving triangles congruent. Why is this true?<br> | |
| Given two right triangles $\triangle ABC$ and $\triangle A'B'C'$ with right angles $\angle B$ and $\angle B'$, if $AB = A'B'$ (Leg) and $AC = A'C'$ (Hypotenuse), then the triangles are congruent.<br><br>[HL] | In the figure below, $CD$ is the perpendicular bisector of $AB$ and $\triangle ABC$ is isosceles. Name the two congruent triangles appropriately, and describe the necessary steps for proving them congruent using HL.<br> | |
| The opposite sides of a parallelogram are congruent.<br><br>The opposite angles of a parallelogram are congruent.<br><br>The diagonals of a parallelogram bisect each other. | In the figure below, $BE \cong DE$ and $\angle CBE \cong \angle ADE$. Prove $ABCD$ is a parallelogram.<br> | |
| The midsegment of a triangle is a line segment that connects the midpoints of two sides of a triangle; the midsegment is parallel to the third side of the triangle and is half the length of the third side. | $\overline{DE}$ is the midsegment of $\triangle ABC$. Find the perimeter of $\triangle ABC$, given the labeled segment lengths.<br> | |
| The three medians of a triangle are concurrent at the centroid; the centroid divides each median into two parts, from vertex to centroid and centroid to midpoint in a ratio of $2:1$. | If $\overline{AE}$, $\overline{BF}$, and $\overline{CD}$ are medians of $\triangle ABC$, find the lengths of segments $BG$, $GE$, and $CG$, given the labeled lengths.<br> | |

## Problem Set

Use any of the assumptions, facts, and/or properties presented in the tables above to find $x$ and/or $y$ in each figure below. Justify your solutions.

1. Find the perimeter of parallelogram $ABCD$. Justify your solution.

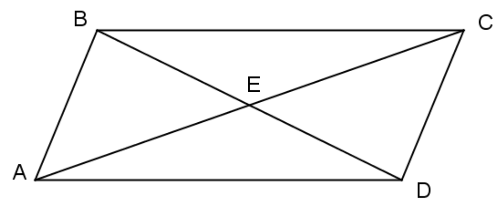



2. $AC = 34$

   $AB = 26$

   $BD = 28$

   Given parallelogram $ABCD$, find the perimeter of $\triangle CED$. Justify your solution.

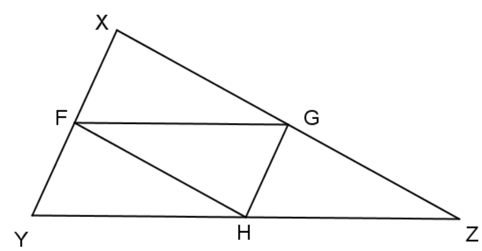



3. $XY = 12$

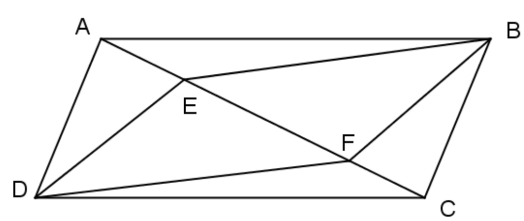
   $XZ = 20$

   $ZY = 24$

   $F$, $G$, and $H$ are midpoints of the sides on which they are located. Find the perimeter of $\triangle FGH$. Justify your solution.




4. $ABCD$ is a parallelogram with $AE = CF$. Prove that $DEBF$ is a parallelogram.




5. $C$ is the centroid of $\triangle RST$. $RC = 16$, $CL = 10$, $TJ = 21$

   $SC =$ ___________

   $TC =$ ___________

   $KC =$ ___________