Unit #7 Similarity Facts

Topic #1

Similar Polygons: Two polygons are similar if their vertices can be paired so that

1) corresponding angles are congruent
2) corresponding sides are proportional

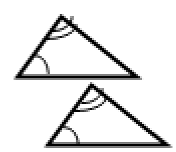
Similarity Ratio: The ratio of corresponding sides based on the similarity statement (small:big or big:small)

Perimeter Ratio: Will always equal the similarity ratio

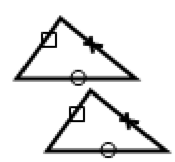
Scale Factor: What you multiply to create a new figure

Triangles are similar by……..

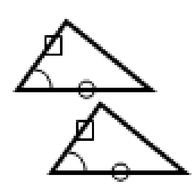
AA Similarity: If two angles of one triangle are congruent to two angles of another triangle, then Δ's are ~



SSS Similarity: If the measure of the corresponding sides of two triangles are proportional, then Δ's are ~



SAS Similarity: If the measure of two sides of a triangle are proportional to the measure of two corresponding sides of another triangle, and the included angles are congruent, then Δ's are ~



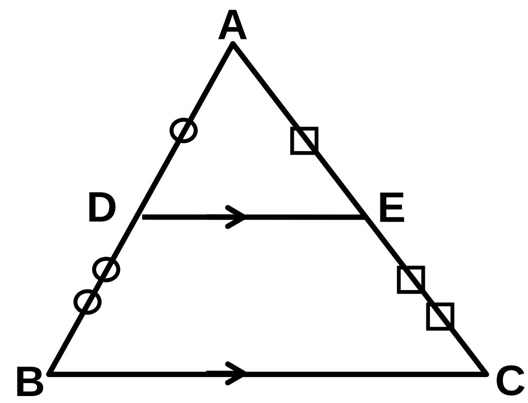
Topic #2

Triangle Proportionality Theorem

DE || BC

If || lines → segments proportional

$$\frac{AD}{DB} = \frac{AE}{EC}$$



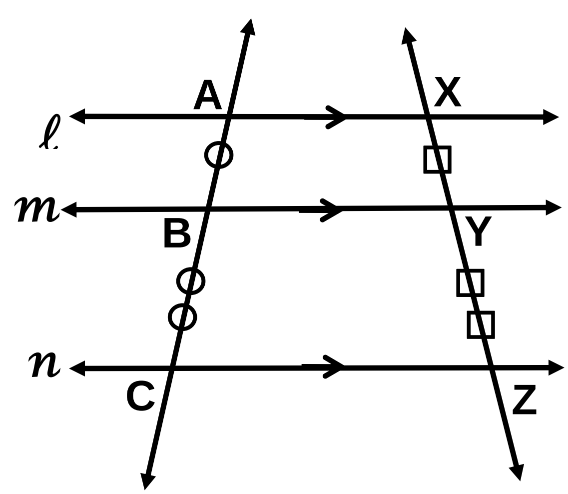
TRIANGLE MIDSEGMENT THEOREM:
If D and E are midpoints then, 2(DE) = BC

Parallel Proportional Segment Theorem

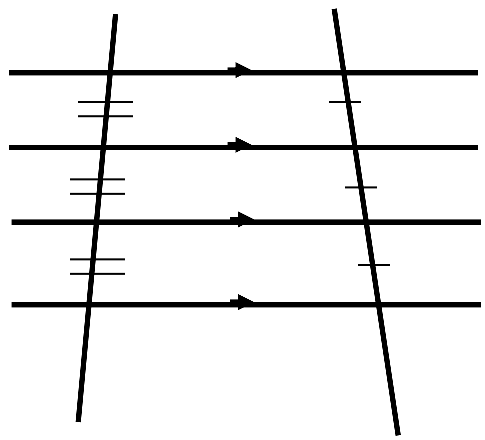
$\ell \parallel m \parallel n$

If || lines → segments proportional

$$\frac{AB}{BC} = \frac{XY}{YZ}$$

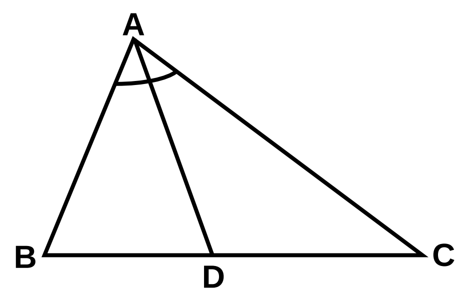


THEOREM: **If three or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segment on every transversal.**



Topic #3 Triangle Angle Bisector Theorem

TRIANGLE ANGLE BISECTOR THEOREM Angle bisectors in a triangle divide the opposite side into segments whose ratio is proportional to the adjacent sides.



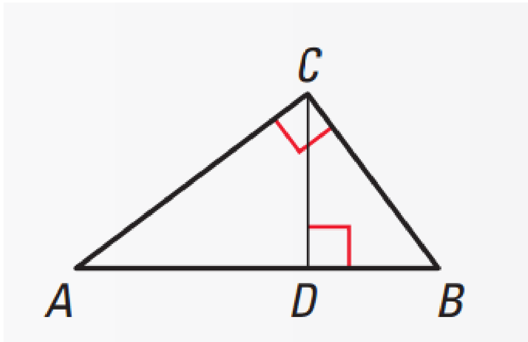
$$\frac{Side}{Side} = \frac{Adjacent\ Piece}{Adjacent\ Piece}$$

$$\frac{AB}{AC} = \frac{BD}{DC}$$

Topic #4 Right Triangle Similarity

If the altitude is drawn to the hypotenuse of a right triangle, then the two triangles formed are similar to the original triangle and to each other.

▲CBD ~▲ABC
▲ACD ~▲ABC
▲CBD ~▲ACD



In a right triangle, the altitude from the right angle to the hypotenuse divides the hypotenuse into two segments.

- Altitude as the Geometric Mean

$$\frac{Part\ 1}{ALTITUDE} = \frac{ALTITUDE}{Part\ 2}$$

- Leg as the Geometric Mean

$$\frac{Hypotenuse}{LEG} = \frac{LEG}{Part}$$