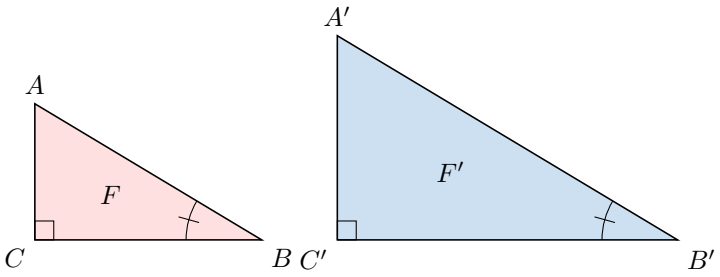
SIMILAR TRIANGLES

A ANGLE-ANGLE SIMILARITY

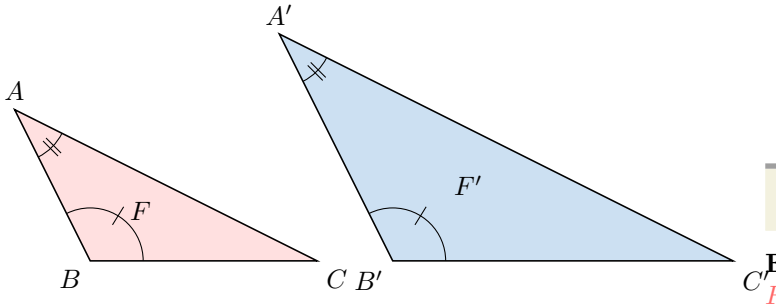
A.1 CHOOSING MATHEMATICAL ARGUMENTATION

MCQ 1: Choose the correct mathematical argumentation for why the figures F and F' are similar.



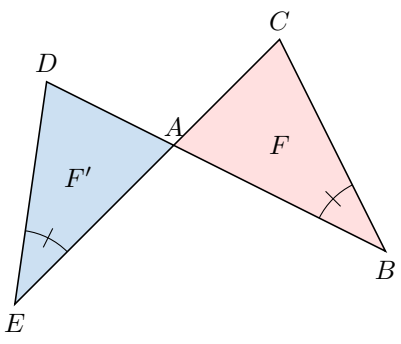
- ☐ The triangles look the same.
- ☐ Both figures are right triangles with a common marked angle, so the triangles F and F' are similar.
- ☐ Both figures are right triangles, so the triangles F and F' are similar.
- ☐ Both triangles have the same marked angle, so the triangles F and F' are similar.

MCQ 2: Choose the correct mathematical argumentation for why the figures F and F' are similar.



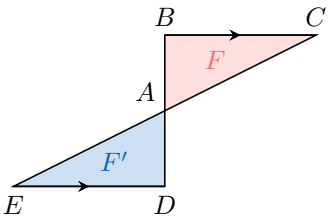
- ☐ The triangles look the same.
- ☐ Both figures are right triangles with a common marked angle, so the triangles F and F' are similar.
- ☐ Both triangles have the same marked angle, so the triangles F and F' are similar.
- ☐ Both triangles have two marked angles in common, so the triangles F and F' are similar.

MCQ 3: Choose the correct mathematical argumentation for why the figures F and F' are similar.



- ☐ The triangles look the same.
- ☐ Both triangles have a common marked angle and a pair of vertically opposite angles, so the triangles F and F' are similar.
- ☐ Both triangles have the same marked angle, so the triangles F and F' are similar.
- ☐ Both figures have a pair of vertically opposite angles, so the triangles F and F' are similar.

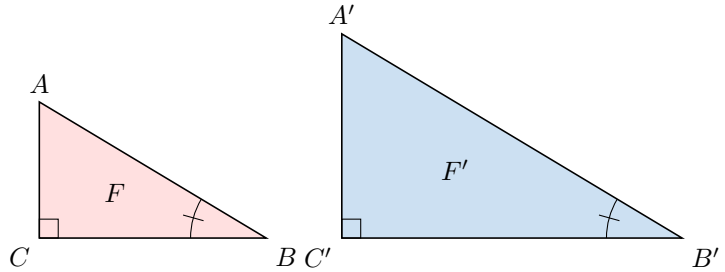
MCQ 4: Choose the correct mathematical argumentation for why the figures F and F' are similar.



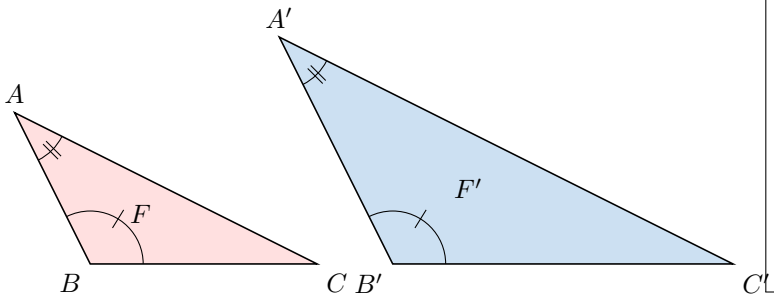
- ☐ The triangles look the same.
- ☐ Both triangles have a common marked angle and a pair of vertically opposite angles, so the triangles F and F' are similar.
- ☐ Since the lines are parallel, the corresponding angles in the two triangles are equal. So, the triangles F and F' are similar.
- ☐ Both figures have a pair of vertically opposite angles, so the triangles F and F' are similar.

A.2 WRITING MATHEMATICAL ARGUMENTATION

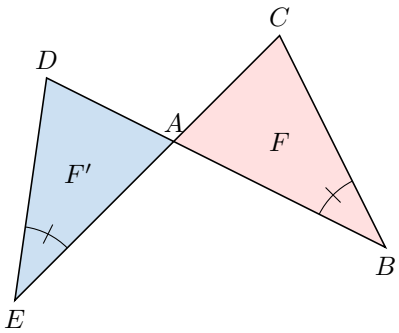
Ex 5: Justify with mathematical argumentation why the figures F and F' are similar.



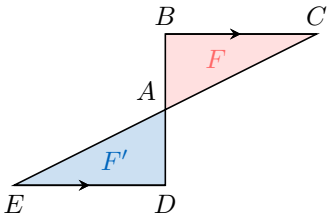
Ex 6: Justify with mathematical argumentation why the figures F and F' are similar.



Ex 7: Justify with mathematical argumentation why the figures F and F' are similar.

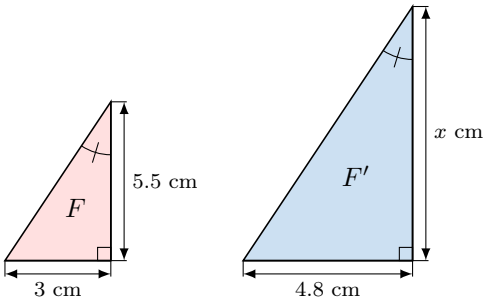


Ex 8: Justify with mathematical argumentation why the figures F and F' are similar.



A.3 FINDING UNKNOWN LENGTHS IN SIMILAR TRIANGLES

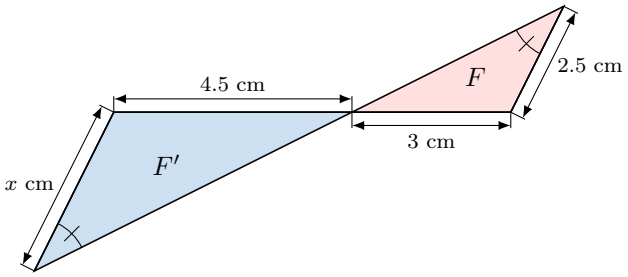
Ex 9:



Find x

$x =$ ☐

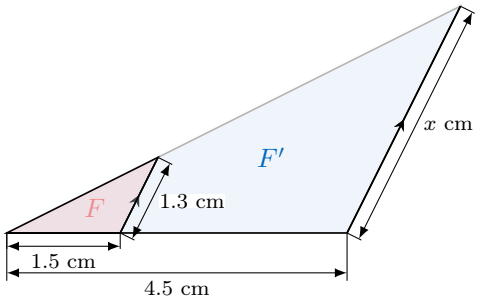
Ex 10:



Find x.

$x =$ ☐

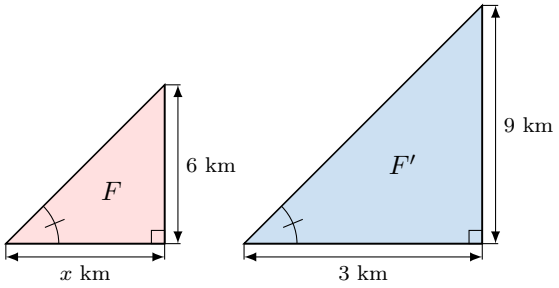
Ex 11:



Find x.

$x =$ ☐

Ex 12:



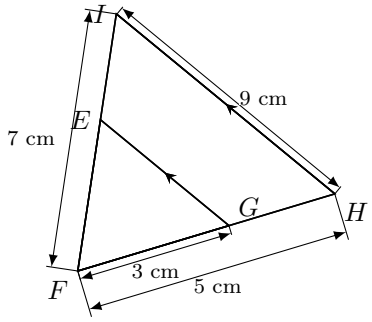
Find x.

$x =$ ☐

B THALES'S THEOREM

B.1 APPLYING THALES'S THEOREM WITHOUT JUSTIFICATION

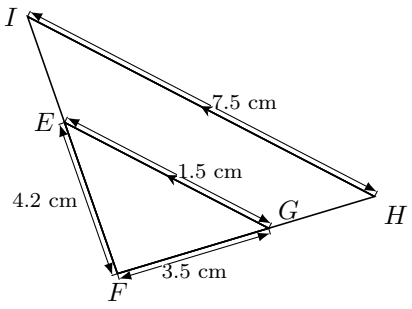
Ex 13: The lines $\overleftrightarrow{GH}$ and $\overleftrightarrow{EI}$ intersect at F, and the lines $\overleftrightarrow{GE}$ and $\overleftrightarrow{HI}$ are parallel. Given $FG = 3$ cm, $FH = 5$ cm, $FI = 7$ cm, and $HI = 9$ cm:



Calculate the lengths FE and EG.

$FE =$ ☐ cm and $EG =$ ☐ cm.

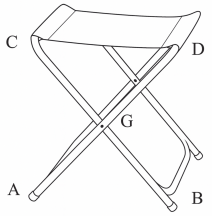
Ex 14: The lines $\overleftrightarrow{GH}$ and $\overleftrightarrow{EI}$ intersect at F, and the lines $\overleftrightarrow{GE}$ and $\overleftrightarrow{HI}$ are parallel. Given $FG = 3.5$ cm, $FE = 4.2$ cm, $EG = 1.5$ cm, and $HI = 7.5$ cm:



Calculate the lengths FI and FH.

$FI =$ ☐ cm and $FH =$ ☐ cm.

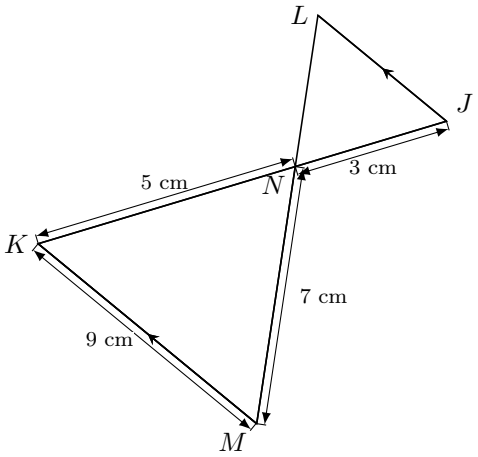
Ex 15: A folding stool is modeled geometrically with segments $\overline{CB}$ and $\overline{AD}$ for the metal frame and segment $\overline{CD}$ for the fabric seat. Given $CG = DG = 30$ cm, $AG = BG = 45$ cm, and $AB = 51$ cm, and knowing that the seat $\overleftrightarrow{CD}$ is parallel to the ground represented by $\overleftrightarrow{AB}$:



Determine the length of the seat CD.

$CD =$ ☐ cm

Ex 16: The lines $\overleftrightarrow{JK}$ and $\overleftrightarrow{LM}$ intersect at N, and the lines $\overleftrightarrow{JL}$ and $\overleftrightarrow{KM}$ are parallel. Given $JN = 3$ cm, $NK = 5$ cm, $LM = 7$ cm, and $KM = 9$ cm:

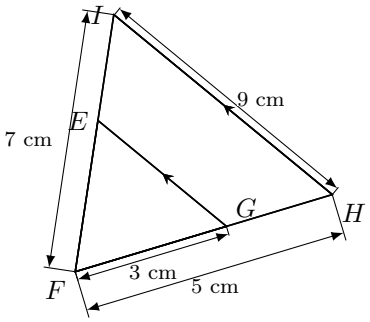


Calculate the lengths NL and LJ.

$NL =$ ☐ cm and $LJ =$ ☐ cm.

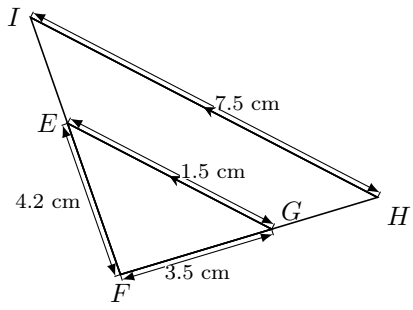
B.2 APPLYING THALES'S THEOREM

Ex 17: The lines $\overleftrightarrow{GH}$ and $\overleftrightarrow{EI}$ intersect at F, and the lines $\overleftrightarrow{GE}$ and $\overleftrightarrow{HI}$ are parallel. Given $FG = 3$ cm, $FH = 5$ cm, $FI = 7$ cm, and $HI = 9$ cm:



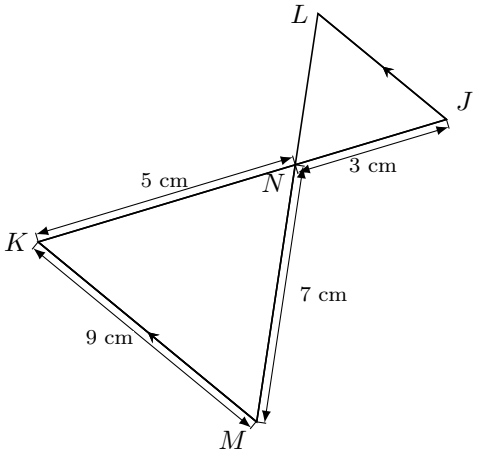
Calculate the lengths FE and EG. Justify.

Ex 18: The lines $\overleftrightarrow{GH}$ and $\overleftrightarrow{EI}$ intersect at F, and the lines $\overleftrightarrow{GE}$ and $\overleftrightarrow{HI}$ are parallel. Given $FG = 3.5$ cm, $FE = 4.2$ cm, $EG = 1.5$ cm, and $HI = 7.5$ cm:



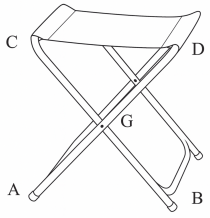
Calculate the lengths FI and FH. Justify.

Ex 19: The lines $\overleftrightarrow{JK}$ and $\overleftrightarrow{LM}$ intersect at N, and the lines $\overleftrightarrow{JL}$ and $\overleftrightarrow{KM}$ are parallel. Given $JN = 3$ cm, $NK = 5$ cm, $LM = 7$ cm, and $KM = 9$ cm:



Calculate the lengths NL and LJ. Justify.

Ex 20: A folding stool is modeled geometrically with segments $\overline{CB}$ and $\overline{AD}$ for the metal frame and segment $\overline{CD}$ for the fabric seat. Given $CG = DG = 30$ cm, $AG = BG = 45$ cm, and $AB = 51$ cm, and knowing that the seat $\overleftrightarrow{CD}$ is parallel to the ground represented by $\overleftrightarrow{AB}$:



Calculate the length of the seat CD. Justify.