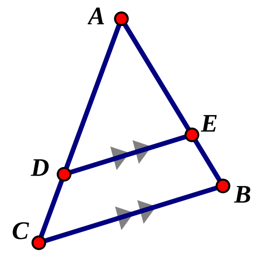
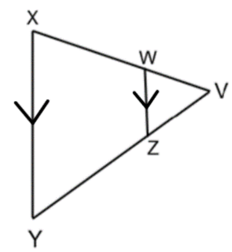
Name: ____________________________ Date: ______________________

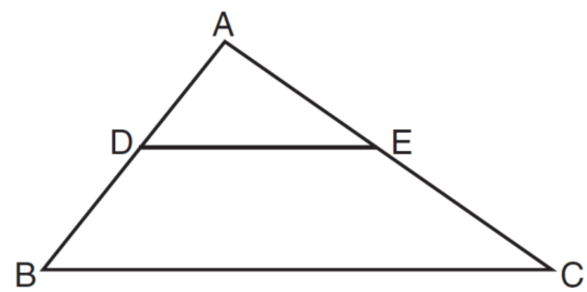
UNIT 5 **LESSON 3**

AIM: WHAT IS THE TRIAGNLE SIDE-SPLITTER THEOREM?

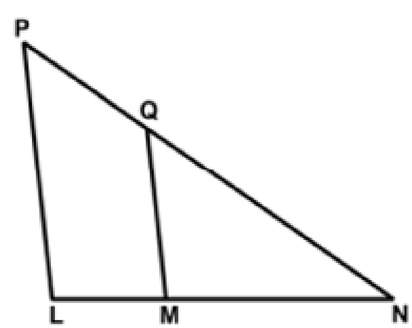
TRIANGLE SIDE-SPLITTER THEOREM	DIAGRAM 1	DIAGRAM 2
A line segment splits two sides of a triangle proportionally if and only if it is ________________ to the third side.	 Sides ________ and _______ are split proportionally.	 Sides ________ and _______ are split proportionally.

Example 2: In ΔABC as shown below, points *D* and *E* are located on sides $\overline{AB}$ and $\overline{AC}$, respectively. Line segment *DE* is drawn such that AE = 2.5, EC = 7.5, AD = 1.25 , and DB = 3.75.

Explain why $\overline{DE}$ is parallel to $\overline{BC}$.



Example 3: Which of the following segment lengths would justify the claim that $\overline{PL} \parallel \overline{QM}$



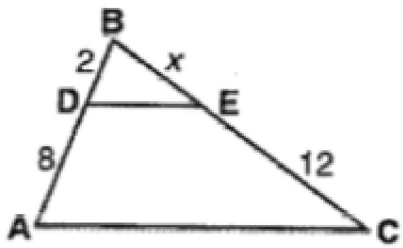
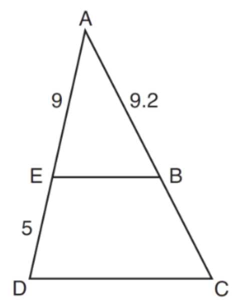
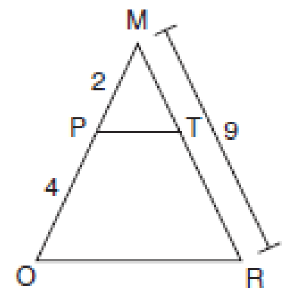
(1) $LM = 8, MN = 12, PQ = 10, and\ QN = 14$

(2) $LM = 5, MN = 10, PQ = 8, and\ QN = 18$

(3) $LM = 6, MN = 10, PQ = 9, and\ QN = 15$

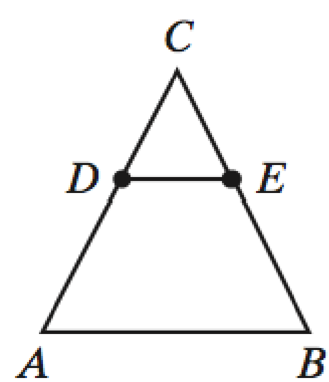
(4) $LM = 10, MN = 15, PQ = 12, and\ QN = 20$

SOLVING MISSING LENGTHS – 3 PROPORTION CASES

CASE 1	CASE 2	CASE 3
$\frac{\text{upper left}}{\text{lower left(bad)}} = \frac{\text{upper right}}{\text{lower right(bad)}}$	$\frac{\text{whole left}}{\text{upper left}} = \frac{\text{whole right}}{\text{upper right}}$	$\frac{\text{whole left}}{\text{lower left(bad)}} = \frac{\text{whole right}}{\text{lower right(bad)}}$
Example 3: In the following diagram $\overline{DE} \parallel \overline{AC}$. Find the value of x. 	**Example 4:** In the diagram of ΔADC below, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$. What is the length of $\overline{AC}$, to the *nearest tenth*? 	**Example 5:** Given $\triangle MRO$ shown below, with trapezoid *PTRO*, $MR = 9$, $MP = 2$, and $PO = 4$. What is the length of $\overline{TR}$? 

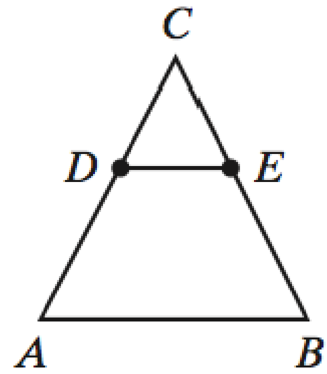
PRACTICE PROBLEMS!

1. *D* is a point on $\overline{AC}$ and *E* is a point on $\overline{BC}$ of ΔABC such that $\overline{DE} \parallel \overline{AB}$. If $CD = 8$, $DA = 2$, and $CB = 7.5$, find CE.



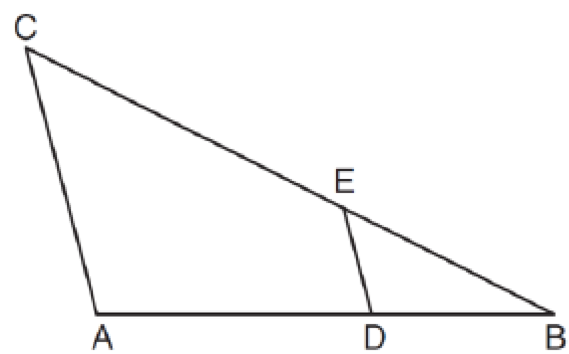
2. *D* is a point on $\overline{AC}$ and *E* is a point on $\overline{BC}$ of ΔABC such that $\overline{DE} \parallel \overline{AB}$. If $CA = 35$, $DA = 10$, and

$CE = 15$, find EB.



3. D is a point on $\overline{AC}$ and E is a point on $\overline{BC}$ of ΔABC such that $\overline{DE} \parallel \overline{AB}$. If $CA = 8$, $AB = 10$, and $CD = 4$, find DE.

4. In the diagram below of ΔABC, D is a point on $\overline{AC}$ and E is a point on $\overline{BC}$, $\overline{AC} \parallel \overline{DE}$, $CE = 25$ inches, $AD = 18$ inches, and $DB = 12$ inches. Find, to the *nearest tenth of an inch,* the length of $\overline{EB}$.

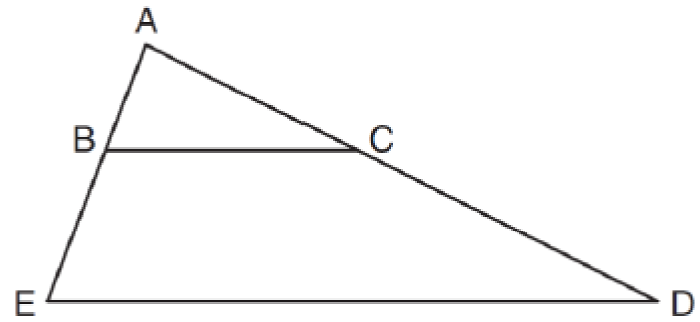


5. In ΔABC, point D is a point on $\overline{AB}$ and E is a point on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of $\overline{AC}$?

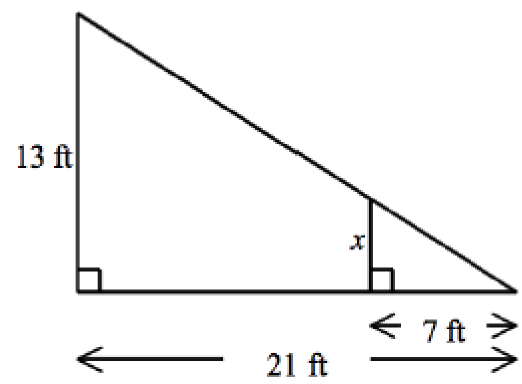
Name: ____ Date: ____________________

HOMEWORK

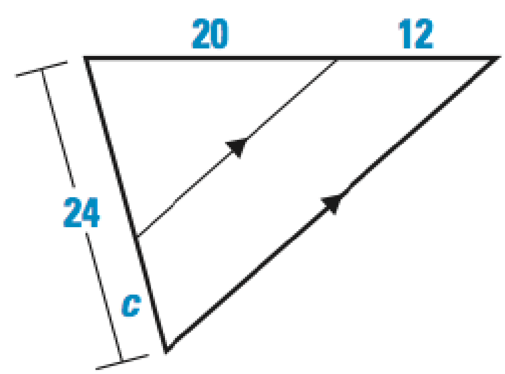
1. In the diagram below of ΔADE, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length $\overline{AC}$.



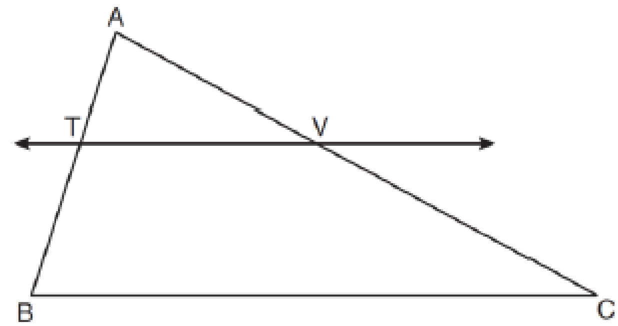
2. Solve for *x* to the nearest tenth.



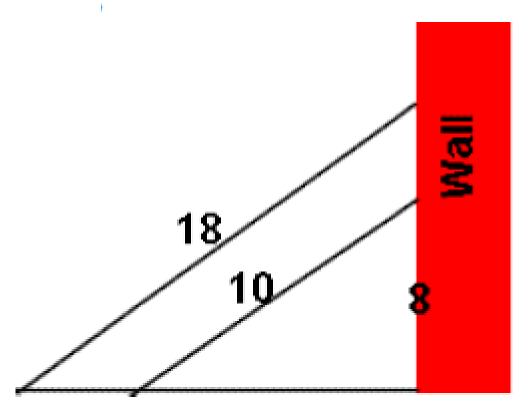
3. Solve for *c*.



4. In the diagram below of ΔABC, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$. What is the length of $\overline{VC}$?



5. Two ladders are leaned up against a wall such that they make the same angle with the ground. The 10 foot ladder reaches 8 feet up the wall. How much further up the wall does the 18 foot ladder reach?



6. The map at the right shows the walking paths at a local park. The garden walkway is parallel to the walkway between the monument and the pond. How long is the path from the pond to the playground?