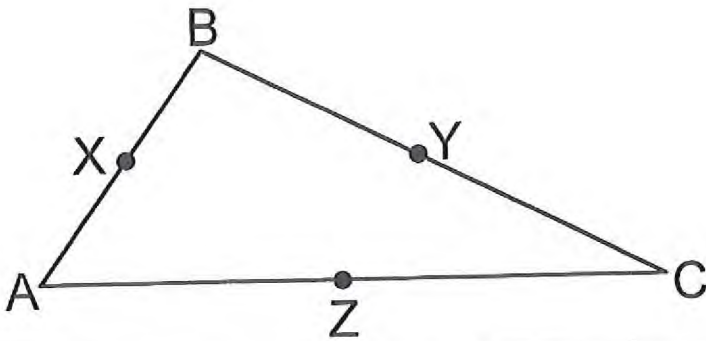


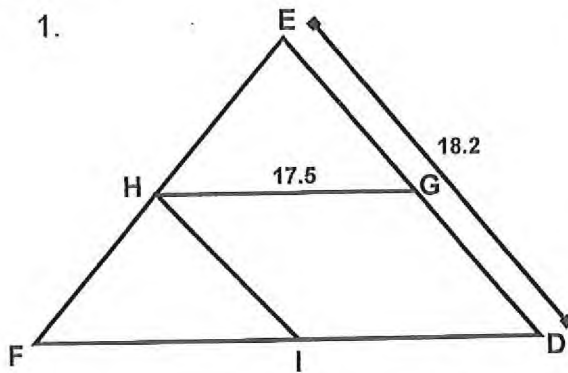
Triangle Midsegment Theorem:

A midsegment is _____ to the third side of the triangle and is _____ as long as the third side.



Examples:

1.



Find each measure.

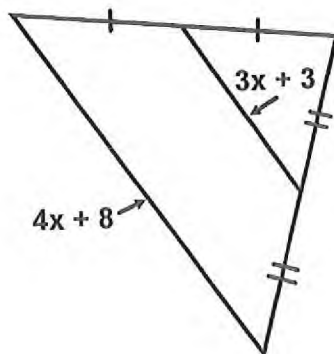
A) $DF =$ _____

B) $GE =$ _____

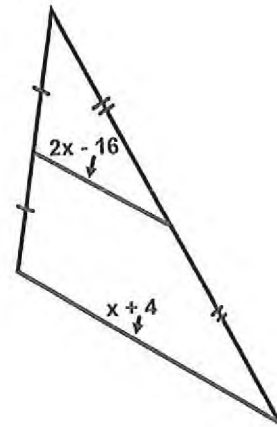
C) $FI =$ _____

D) $HI =$ _____

2. Solve for x .



3. Solve for x .

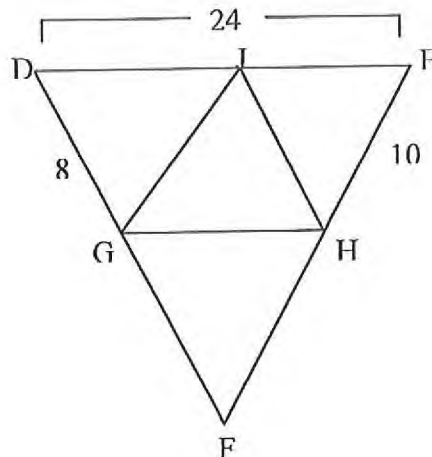


Triangle Midsegment Theorem Practice

Directions: Use the diagram shown and the given information answer the following questions.

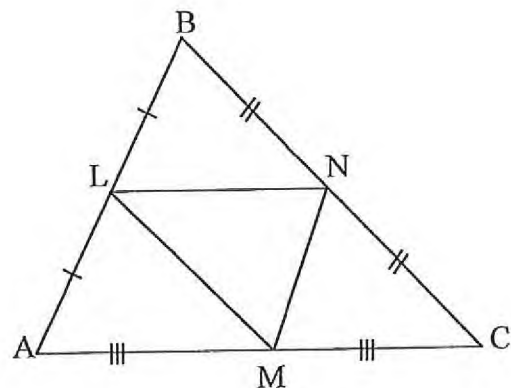
\overline{GH} , \overline{HJ} and \overline{JG} are midsegments of $\triangle DEF$

- 1) $\overline{JH} \parallel$ _____
- 2) $\overline{DE} \parallel$ _____
- 3) $EF =$ _____
- 4) $GH =$ _____
- 5) $DF =$ _____
- 6) $JH =$ _____
- 7) Find the perimeter of $\triangle GHJ$ _____



Directions: Use $\triangle ABC$, where L , M , and N are midpoints of the sides.

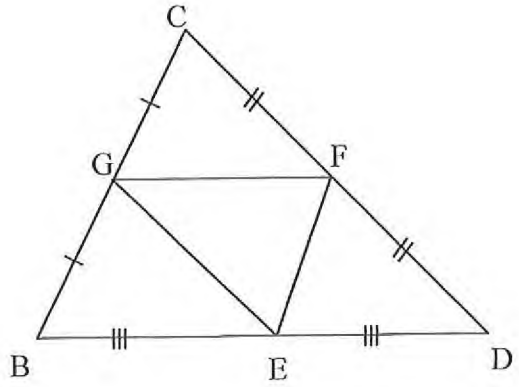
- 8) $\overline{LM} \parallel$ _____
- 9) $\overline{AB} \parallel$ _____
- 10) If $AC = 20$, then $LN =$ _____
- 11) If $MN = 7$, then $AB =$ _____
- 12) If $NC = 9$, then $LM =$ _____
- 13) If $LM = 3x + 7$, and $BC = 7x + 6$, then $LM =$ _____



- 14) If $MN = x - 1$, and $AB = 6x - 18$, then $AB =$ _____

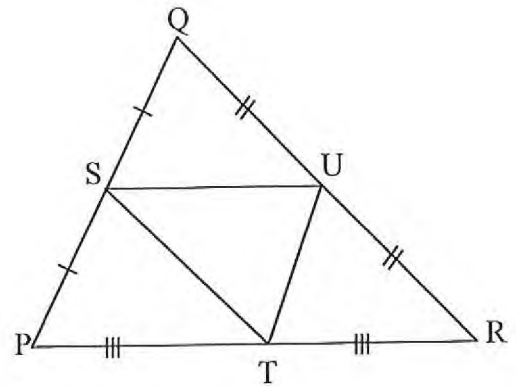
- 15) Given: $CD = 14$
 $GF = 8$
 $GC = 5$

Perimeter of $\triangle BCD =$ _____



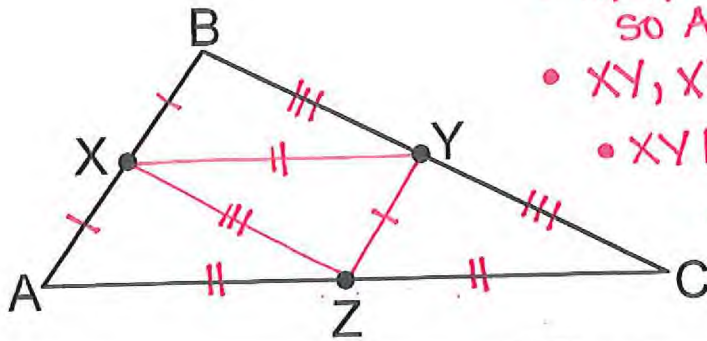
- 16) Given: $PQ = 20$
 $SU = 12$
 $QU = 9$

Perimeter of $\triangle STU =$ _____



Triangle Midsegment Theorem:

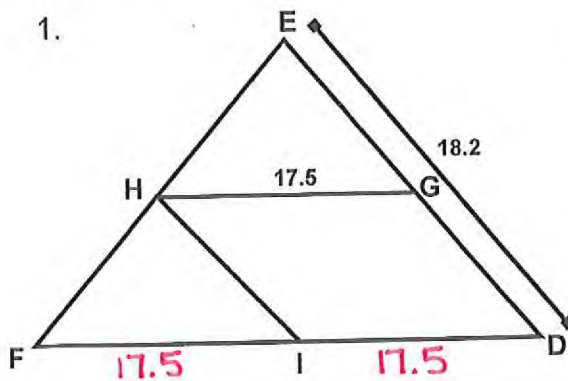
A midsegment is parallel to the third side of the triangle and is half as long as the third side.



- X, Y, Z are midpoints
so $AX=BX, AZ=ZC, BY=CY$
- XY, XZ, YZ are midsegments
- $XY \parallel AC \rightarrow XY = \frac{1}{2}(AC)$ or $AC = 2(XY)$
- $XZ \parallel BC \rightarrow XZ = \frac{1}{2}(BC)$ or $BC = 2(XZ)$
- $YZ \parallel AB \rightarrow YZ = \frac{1}{2}(AB)$ or $AB = 2(YZ)$

Examples:

1.



Find each measure.

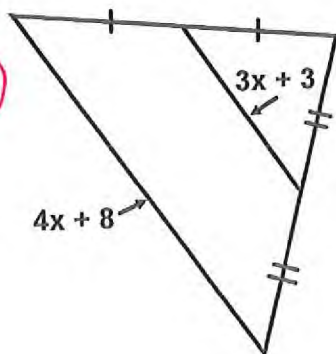
A) $DF = \underline{35}$

B) $GE = \underline{9.1}$

C) $FI = \underline{17.5}$

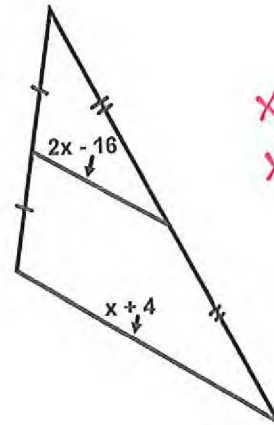
D) $HI = \underline{9.1}$

2. Solve for x .



$$\begin{aligned} 4x+8 &= 2(3x+3) \\ 4x+8 &= 6x+6 \\ 8 &= 2x+6 \\ 2 &= 2x \\ \boxed{1} &= x \end{aligned}$$

3. Solve for x .



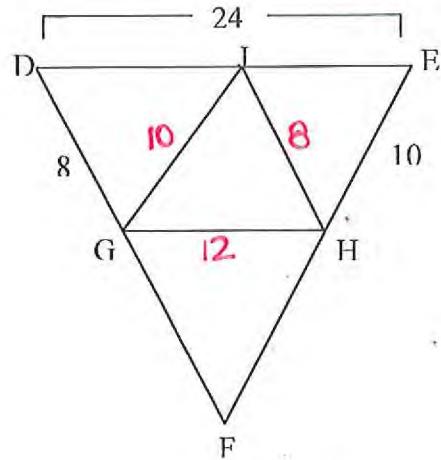
$$\begin{aligned} x+4 &= 2(2x-16) \\ x+4 &= 4x-32 \\ 36 &= 3x \\ \boxed{12} &= x \end{aligned}$$

Triangle Midsegment Theorem Practice

Directions: Use the diagram shown and the given information answer the following questions.

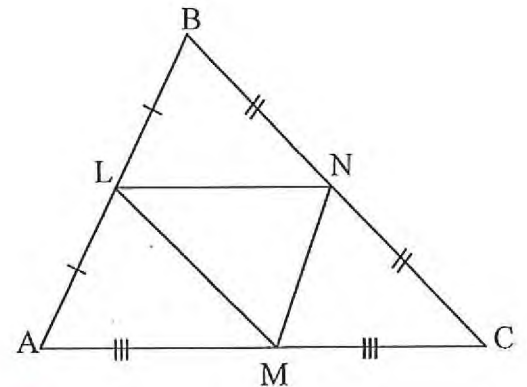
\overline{GH} , \overline{HJ} and \overline{JG} are midsegments of $\triangle DEF$

- 1) $\overline{JH} \parallel \underline{\overline{DE}}$
- 2) $\overline{DE} \parallel \underline{\overline{GH}}$
- 3) $EF = \underline{20}$
- 4) $GH = \underline{12}$
- 5) $DF = \underline{16}$
- 6) $JH = \underline{8}$
- 7) Find the perimeter of $\triangle GHJ$ $10+12+8 = 30$



Directions: Use $\triangle ABC$, where L , M , and N are midpoints of the sides.

- 8) $\overline{LM} \parallel \underline{BC}$
- 9) $\overline{AB} \parallel \underline{NM}$
- 10) If $AC = 20$, then $LN = \underline{10}$
- 11) If $MN = 7$, then $AB = \underline{14}$
- 12) If $NC = 9$, then $LM = \underline{9}$
- 13) If $LM = 3x+7$, and $BC = 7x+6$, then $LM = \underline{31}$



$$\begin{aligned} 7x+6 &= 2(3x+7) \\ 7x+6 &= 6x+14 \\ x+6 &= 14 \\ x &= 8 \end{aligned}$$

$$\begin{aligned} LM &= 3(8)+7 \\ &= 24+7 \\ &= 31 \end{aligned}$$

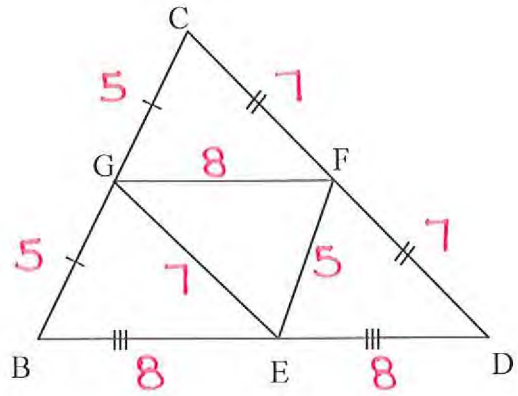
- 14) If $MN = x - 1$, and $AB = 6x - 18$, then $AB = \underline{6}$

$$\begin{aligned} 6x-18 &= 2(x-1) \\ 6x-18 &= 2x-2 \\ 4x-18 &= -2 \\ 4x &= 16 \\ x &= 4 \end{aligned}$$

$$\begin{aligned} AB &= 6(4)-18 \\ &= 24-18 \\ &= 6 \end{aligned}$$

- 15) Given: $CD = 14$
 $GF = 8$
 $GC = 5$

Perimeter of $\triangle BCD = 10 + 14 + 16 = \boxed{40}$



- 16) Given: $PQ = 20$
 $SU = 12$
 $QU = 9$

Perimeter of $\triangle STU = 12 + 9 + 10 = \boxed{31}$

