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# Midsegments of Triangles

## Unit 5 Lesson 1

**Students will be able to:**

Use properties of triangle midsegments.

**Key Vocabulary:**

- Midsegment of a Triangle
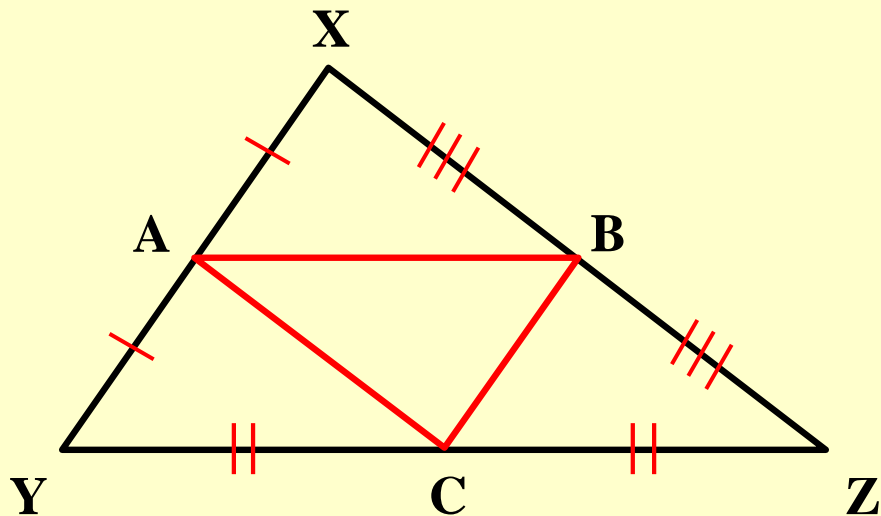- Midsegment Triangle
- Triangle Midsegment Theorem

## MIDSEGMENT OF A TRIANGLE

is a segment that joins the midpoints of two sides of the triangle.

**Midsegments**:

$$\overline{AC} \qquad \overline{BC} \qquad \overline{AB}$$

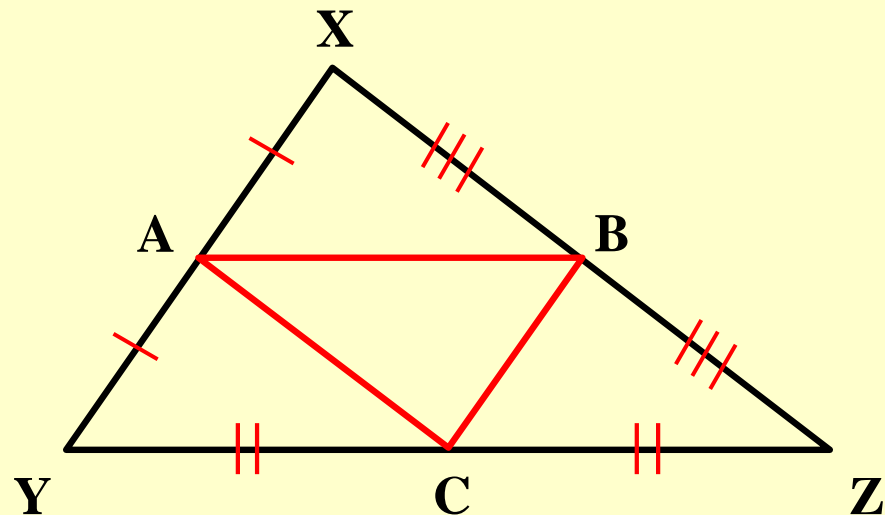# MIDSEGMENTS OF TRIANGLES

**Properties**:

1. It is always parallel to the third side.

$$\overline{AC} \parallel \overline{XZ}$$
$$\overline{BC} \parallel \overline{XY}$$
$$\overline{AB} \parallel \overline{YZ}$$

2. Its length is half the length of the third side.
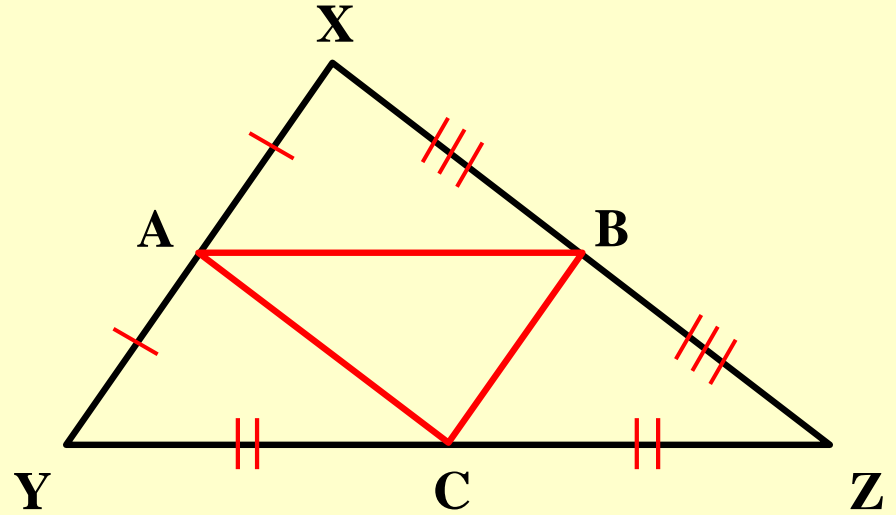
$$m\,\overline{AC} = \frac{1}{2}\,m\,\overline{XZ} \qquad m\,\overline{BC} = \frac{1}{2}\,m\,\overline{XY} \qquad m\,\overline{AB} = \frac{1}{2}\,m\,\overline{YZ}$$

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# MIDSEGMENTS OF TRIANGLES

**MIDSEGMENT TRIANGLE** is a triangle formed by the midsegments of a triangle.

$$\Delta ABC$$

## TRIANGLE MIDSEGMENT THEOREM

"In a triangle, the segment joining the midpoints of any two sides will be parallel to the third side and half its length."

# MIDSEGMENTS OF TRIANGLES

**Sample Problem 1**: Given: $\overline{JK} = 10, \overline{DE} = 6.5, \; \overline{EL} = 3.7$. **Find:**
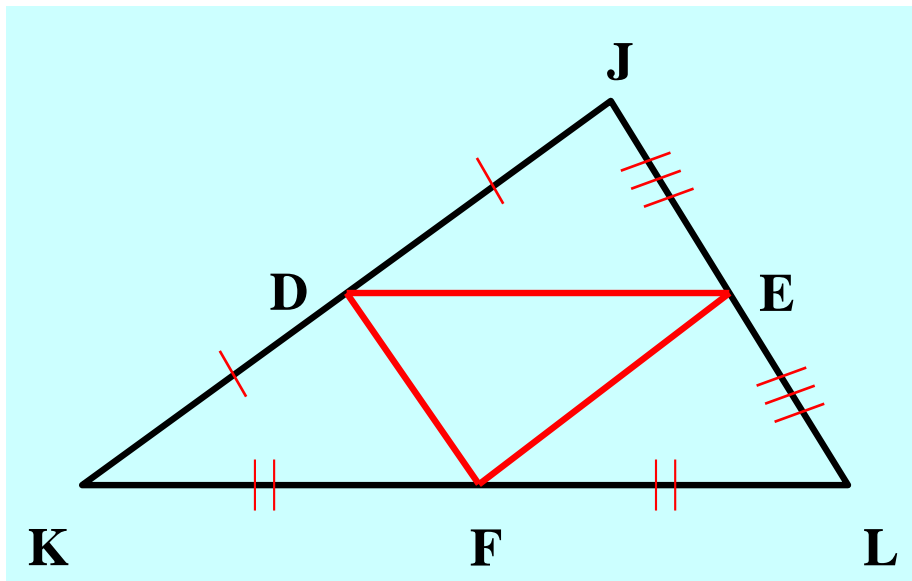
A. $\overline{KD}$

B. $\overline{DJ}$

C. $\overline{DF}$

D. $\overline{JL}$

E. $\overline{KF}$

F. $\overline{FL}$

# MIDSEGMENTS OF TRIANGLES

**Sample Problem 1**: Given: $\overline{JK} = 10, \overline{DE} = 6.5, \overline{EL} = 3.7$. **Find:**

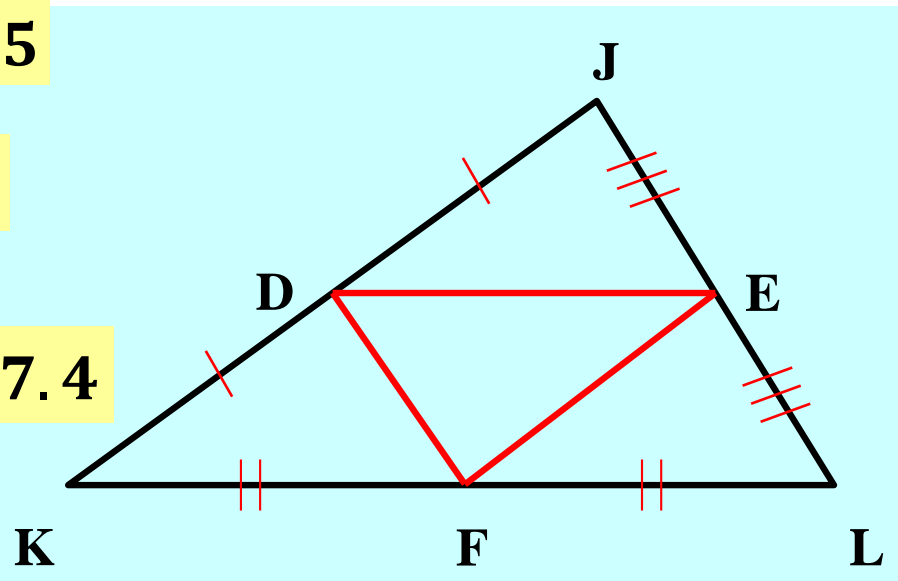*A.* $\overline{KD} = \frac{1}{2}\overline{JK} = \frac{1}{2}(10) = \overline{KD} = 5$

*B.* $\overline{DJ} = \frac{1}{2}\overline{JK} = \frac{1}{2}(10) = \overline{DJ} = 5$

*C.* $\overline{DF} = \overline{EL} = \overline{DF} = 3.7$

*D.* $\overline{JL} = 2 \cdot \overline{EL} = 2 \cdot 3.7 = \overline{JL} = 7.4$

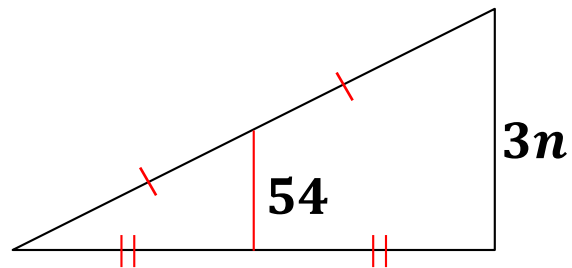*E.* $\overline{KF} = \overline{DE} = \overline{KF} = 6.5$

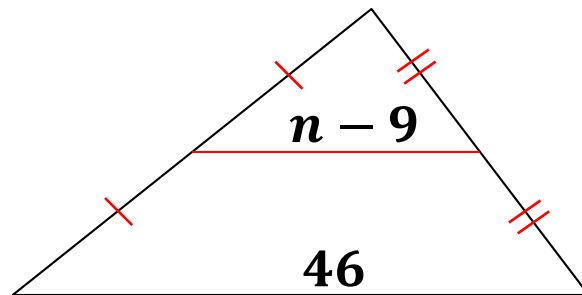*F.* $\overline{FL} = \overline{DE} = \overline{FL} = 6.5$

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**MIDSEGMENTS OF TRIANGLES**

**Sample Problem 2**: Find the value of $n$.

A.

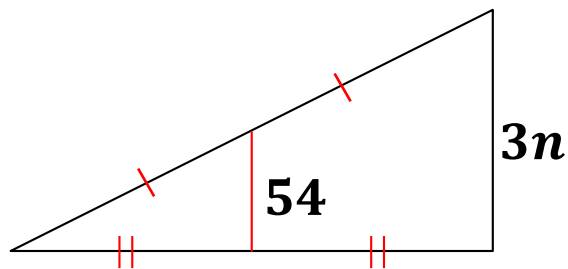$3n$

$54$

B.

$n - 9$

$46$

**MIDSEGMENTS OF TRIANGLES**

**Sample Problem 2**: Find the value of $n$.

A.

$3n$

$54$

$$3n = 2(54)$$
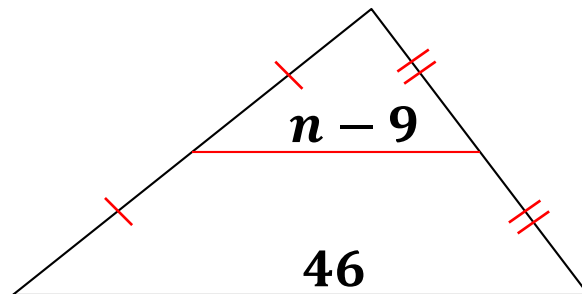
$$3n = 108$$

$$\frac{3n}{3} = \frac{108}{3}$$

$$n = 60$$

B.

$n - 9$

$46$

$$46 = 2(n - 9)$$
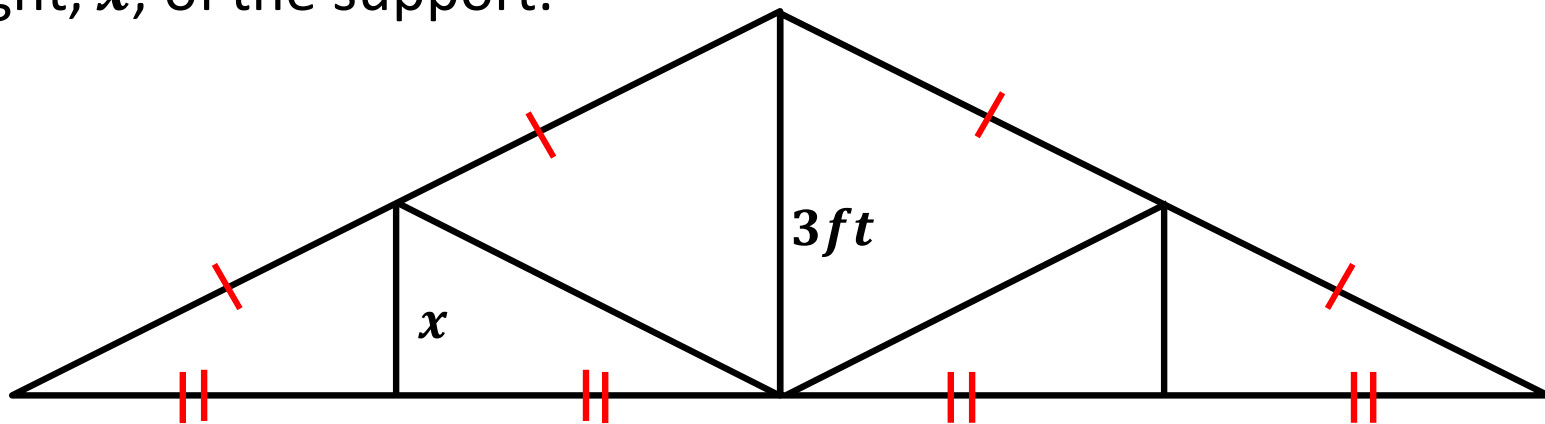
$$46 = 2n - 18$$

$$46 + 18 = 2n$$

$$64 = 2n$$

$$n = 32$$

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**Sample Problem 3**: In the house's roof, as shown below, find the height, $x$, of the support.

# MIDSEGMENTS OF TRIANGLES

**Sample Problem 3**: In the house's roof, as shown below, find the height, $x$, of the support.



$$2x = 3ft$$

$$x = \frac{3}{2}ft = 1.5ft$$