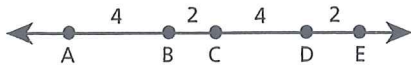


Add to Find Congruent Segments

Add segments to find the length of a new segment.



Is $\overline{AC} \cong \overline{CE}$?

1. Find lengths of given segments. Add.

$$\overline{AB} + \overline{BC} = \overline{AC}$$

$$4 + 2 = 6 \quad \overline{AC} = 6$$

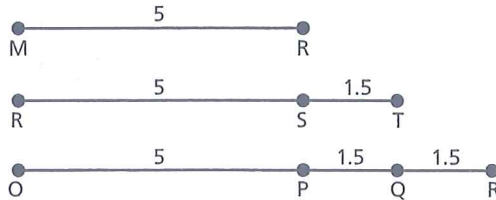
$$\overline{CD} + \overline{DE} = \overline{CE}$$

$$4 + 2 = 6 \quad \overline{AC} = 6$$

2. Compare given segments.

$$\overline{AC} \cong \overline{CE}$$

Use the diagram. Write true or false for each statement.



1 $\overline{MR} \cong \overline{RT}$ False

2 $\overline{MR} \cong \overline{RP}$ False

3 $\overline{OP} \cong \overline{TR}$ False

4 $\overline{PR} \cong \overline{RS}$ False

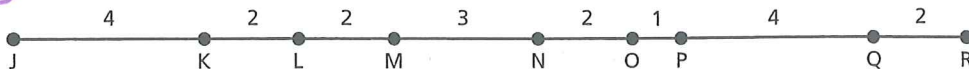
5 $\overline{QO} \cong \overline{RT}$ True

6 $\overline{SR} \cong \overline{MR}$ True

7 $\overline{RT} \cong \overline{QO}$ True

8 $\overline{RP} \cong \overline{RT}$ False

Find the length of the indicated segments. Circle the congruent segments in each row.



9 $\overline{JK} =$ 4

$\overline{JM} =$ 8

$\overline{MK} =$ 4

$\overline{RP} =$ 6

10 $\overline{LO} =$ 7

$\overline{MN} =$ 3

$\overline{PR} =$ 6

$\overline{KN} =$ 7

11 $\overline{MJ} =$ 8

$\overline{OL} =$ 7

$\overline{QN} =$ 7

$\overline{PR} =$ 6

12 $\overline{MP} =$ 6

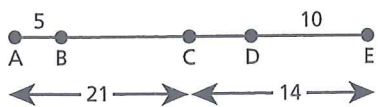
$\overline{JM} =$ 8

$\overline{KN} =$ 7

$\overline{LP} =$ 8

Subtract to Find Segment Lengths

Use what is known about line segment lengths. Subtract to find missing line segment measurements.



- Use the lengths you know.
 $\overline{AC} = \overline{AB} + \overline{BC}$ $\overline{AC} = 21$ $\overline{AB} = 5$
- Subtract given lengths.
 $21 - 5 = 16$
- $\overline{BC} = 16$

Use each diagram to find the lengths of the given segments.

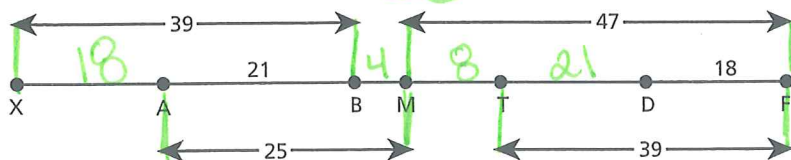
1 $\overline{CE} = 9$ $\overline{DE} = 6$ $\overline{CF} = 15$

2 $\overline{QR} = 20$ $\overline{PS} = 39$ $\overline{ST} = 8.5$

3 $\overline{JK} = 30$ $\overline{JM} = 78$ $\overline{KN} = 76$

4 $\overline{SV} = 44$ $\overline{UV} = 16$ $\overline{TW} = 26$

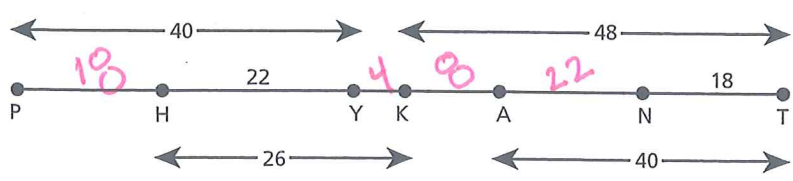
Use the diagram to find the segment lengths.



- | | | |
|-------------------------|-------------------------|-------------------------|
| 5 $\overline{XA} = 18$ | 6 $\overline{AB} = 21$ | 7 $\overline{BM} = 4$ |
| 8 $\overline{MT} = 8$ | 9 $\overline{TD} = 21$ | 10 $\overline{DF} = 18$ |
| 11 $\overline{XB} = 39$ | 12 $\overline{BT} = 12$ | 13 $\overline{AT} = 33$ |

Find Congruent Line Segments

Use what is known to find the missing segment lengths.



Find the length of these line segments.

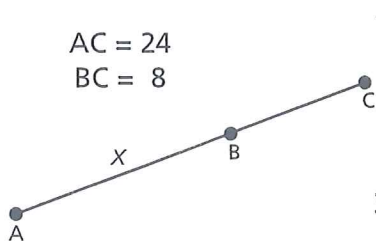
- | | |
|-------------------------|-------------------------|
| 1 $\overline{PH} = 18$ | 2 $\overline{PY} = 40$ |
| 3 $\overline{PK} = 44$ | 4 $\overline{PA} = 52$ |
| 5 $\overline{YK} = 5$ | 6 $\overline{YA} = 12$ |
| 7 $\overline{YN} = 34$ | 8 $\overline{YT} = 52$ |
| 9 $\overline{HK} = 26$ | 10 $\overline{HA} = 34$ |
| 11 $\overline{HT} = 74$ | 12 $\overline{KA} = 8$ |
| 13 $\overline{KN} = 30$ | 14 $\overline{KT} = 48$ |
| 15 $\overline{AN} = 22$ | 16 $\overline{AT} = 40$ |

Use the diagram and your information above. Are these segments congruent? Write true or false.

- | | |
|---|---|
| 17 $\overline{PH} \cong \overline{TN}$ <u>true</u> | 18 $\overline{HK} \cong \overline{YA}$ <u>False</u> |
| 19 $\overline{PY} \cong \overline{YN}$ <u>false</u> | 20 $\overline{TA} \cong \overline{YP}$ <u>true</u> |
| 21 $\overline{HK} \cong \overline{YA}$ <u>false</u> | 22 $\overline{HY} \cong \overline{NA}$ <u>true</u> |
| 23 $\overline{HK} \cong \overline{KN}$ <u>false</u> | 24 $\overline{PK} \cong \overline{KT}$ <u>false</u> |
| 25 $\overline{YP} \cong \overline{YN}$ <u>false</u> | 26 $\overline{PY} \cong \overline{AT}$ <u>true</u> |

Geometry and Algebraic Equations

In order to solve for missing line segment lengths, use the given information. Write an algebraic equation and solve for x .



$AC = 24$
 $BC = 8$

1. Find the value of the segment marked x .

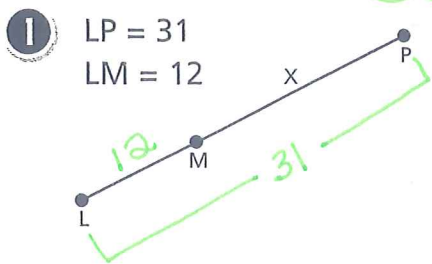
2. The length of \overline{AB} and \overline{BC} is equal to the length of \overline{AC} .
 $AB + BC = AC$

3. Replace with what you know.

$x + 8 = 24$

4. Solve for x .
 $24 - 8 = 16$ $x = 16$

For each diagram, use an algebraic equation and solve for x .

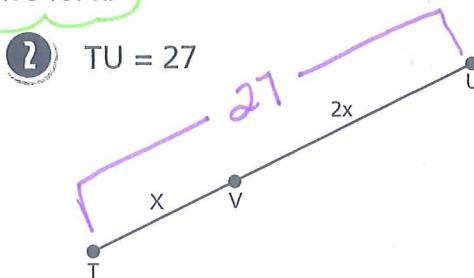


$LP = 31$
 $LM = 12$

$LM + x = LP$

$12 + x = 31$

$x = 19$

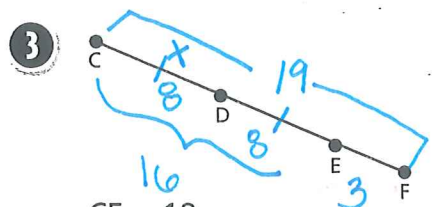


$TU = 27$

$x + 2x = TU$

$x + 2x = 27$

$3x = 27$ $x = 9$



$CF = 19$

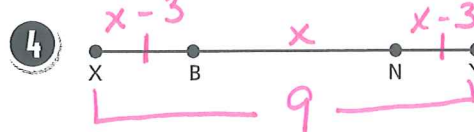
$\overline{CD} \cong \overline{DE}$

$EF = 3$

$x + x + 3 = CF$

$2x + 3 = 19$

$2x = 16$ $x = 8$



$\overline{XB} \cong \overline{NY}$

$XY = 9$

$XB = x - 3$

$(x - 3) + x + (x - 3) = 9$

$3x - 6 = 9$

$3x = 15$ $x = 5$