

# Solving Corresponding Parts of Congruent Triangles

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# Reminder

To solve the corresponding parts of congruent triangles, remember:

# Reminder

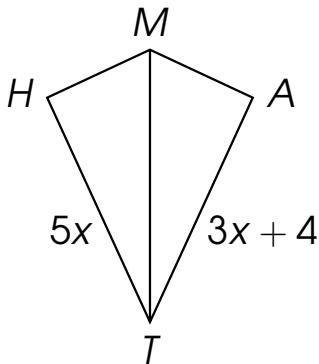
To solve the corresponding parts of congruent triangles, remember:

The Corresponding Parts of Congruent Triangles are Congruent (CPCTC).

# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

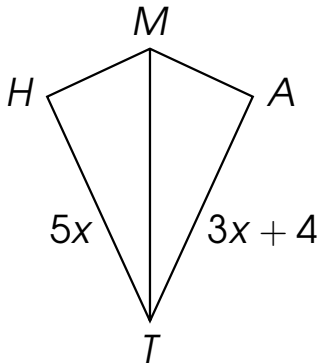


# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$\overline{HT} \cong$

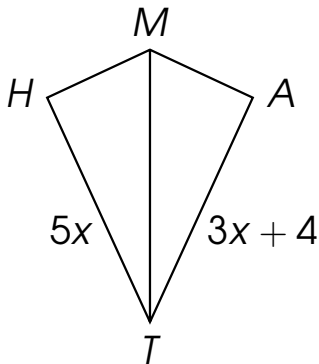


# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$$\overline{HT} \cong \overline{AT}$$



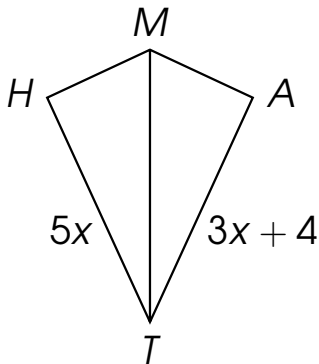
# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$



# Example 1

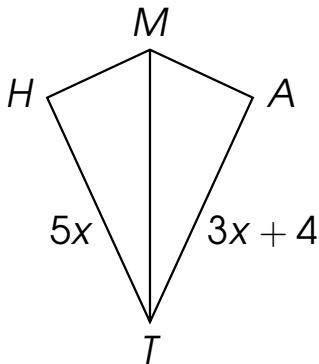
Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$

$$5x = 3x + 4$$





# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

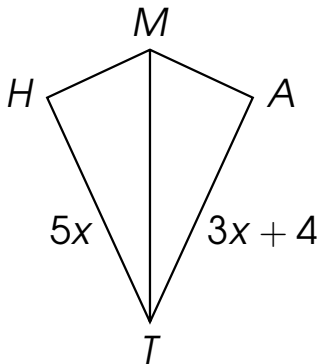
Find:  $x$

$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$

$$5x = 3x + 4$$

$$5x - 3x = 3x - 3x + 4$$



# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

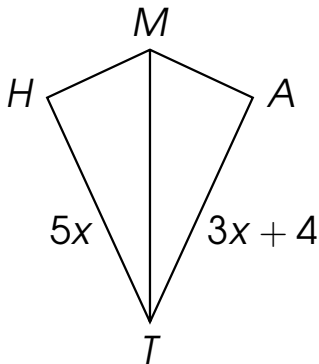
$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$

$$5x = 3x + 4$$

$$5x - 3x = 3x - 3x + 4$$

$$2x = 4$$



# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$

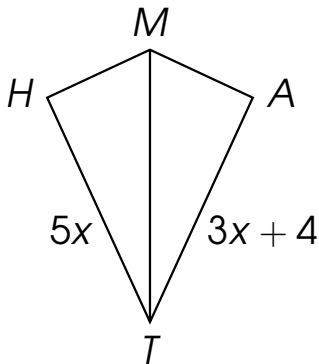
$$5x = 3x + 4$$

$$5x - 3x = 3x - 3x + 4$$

$$2x = 4$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$x = 2$$



# Example 1

Given:  $\triangle MHT \cong \triangle MAT$

Find:  $x$

$$\overline{HT} \cong \overline{AT}$$

$$m\overline{HT} = m\overline{AT}$$

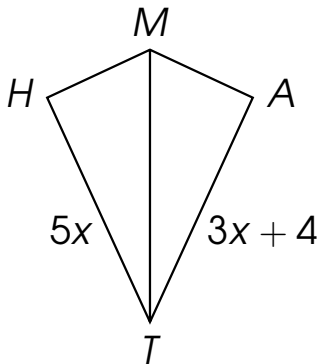
$$5x = 3x + 4$$

$$5x - 3x = 3x - 3x + 4$$

$$2x = 4$$

$$\frac{2x}{2} = \frac{4}{2}$$

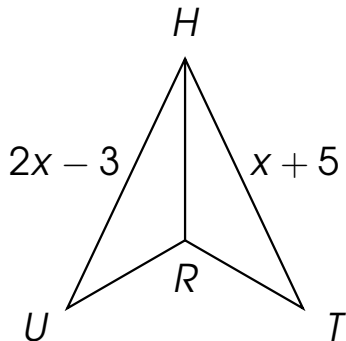
$$x = 2$$



# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

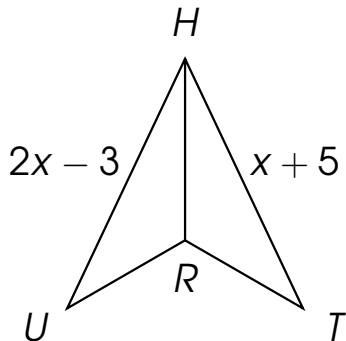


# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

$\overline{HU} \cong$

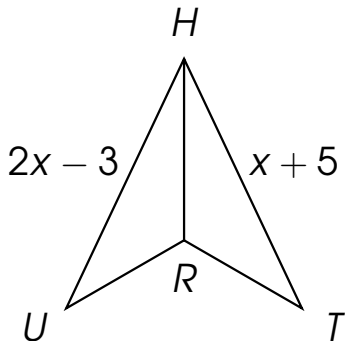


# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

$$\overline{HU} \cong \overline{HT}$$



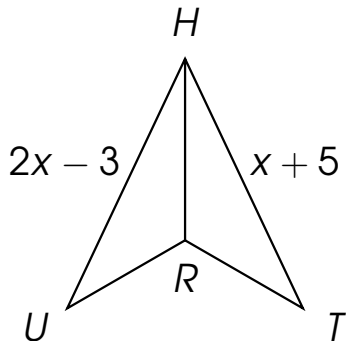
# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

$$\overline{HU} \cong \overline{HT}$$

$$m\overline{HU} = m\overline{HT}$$





# Example 2

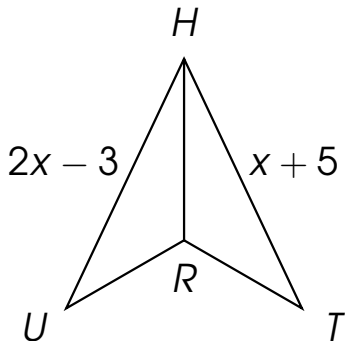
Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

$$\overline{HU} \cong \overline{HT}$$

$$m\overline{HU} = m\overline{HT}$$

$$2x - 3 = x + 5$$



# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

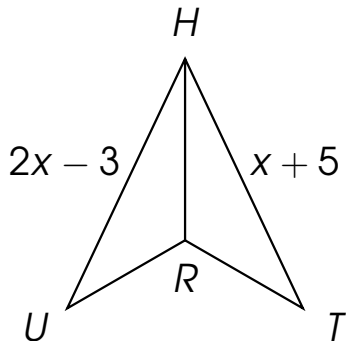
Find:  $x$

$$\overline{HU} \cong \overline{HT}$$

$$m\overline{HU} = m\overline{HT}$$

$$2x - 3 = x + 5$$

$$2x - x - 3 + 3 = x - x + 5 + 3$$



# Example 2

Given:  $\triangle HRU \cong \triangle HRT$

Find:  $x$

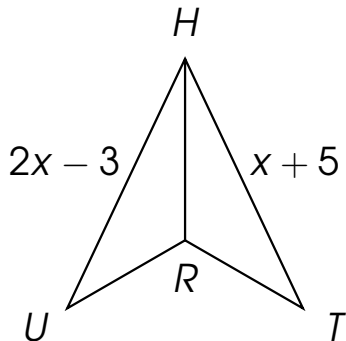
$$\overline{HU} \cong \overline{HT}$$

$$m\overline{HU} = m\overline{HT}$$

$$2x - 3 = x + 5$$

$$2x - x - 3 + 3 = x - x + 5 + 3$$

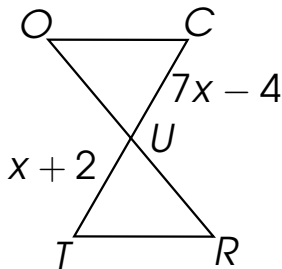
$$x = 8$$



# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

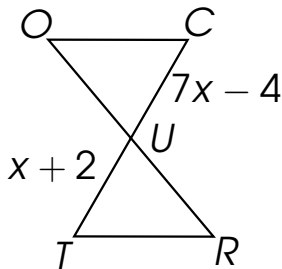


# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$\overline{CU} \cong$

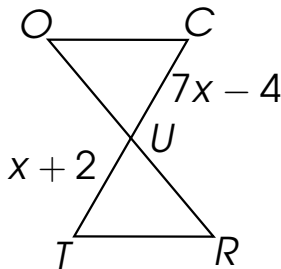


# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$$\overline{CU} \cong \overline{TU}$$



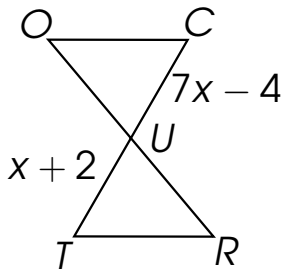
# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$



# Example 3

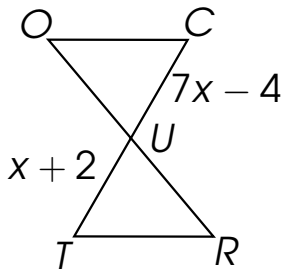
Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$

$$7x - 4 = x + 2$$





# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

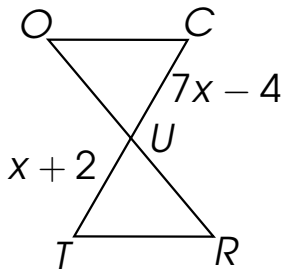
Find:  $x$

$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$

$$7x - 4 = x + 2$$

$$7x - x - 4 + 4 = x - x + 2 + 4$$



# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

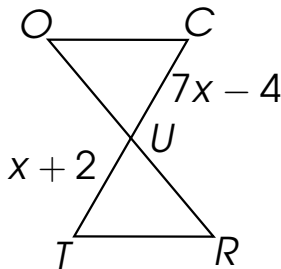
$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$

$$7x - 4 = x + 2$$

$$7x - x - 4 + 4 = x - x + 2 + 4$$

$$6x = 6$$



# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$

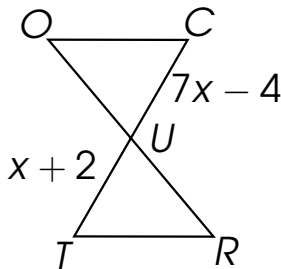
$$7x - 4 = x + 2$$

$$7x - x - 4 + 4 = x - x + 2 + 4$$

$$6x = 6$$

$$\frac{6x}{6} = \frac{6}{6}$$

$$x = 1$$



# Example 3

Given:  $\triangle OCU \cong \triangle RTU$

Find:  $x$

$$\overline{CU} \cong \overline{TU}$$

$$m\overline{CU} = m\overline{TU}$$

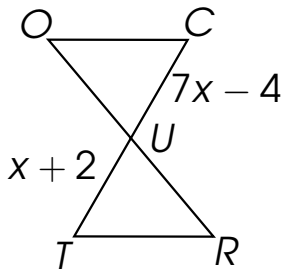
$$7x - 4 = x + 2$$

$$7x - x - 4 + 4 = x - x + 2 + 4$$

$$6x = 6$$

$$\frac{6x}{6} = \frac{6}{6}$$

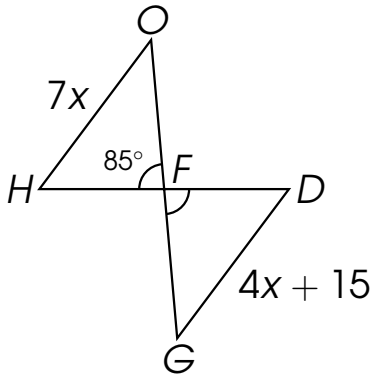
$$x = 1$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

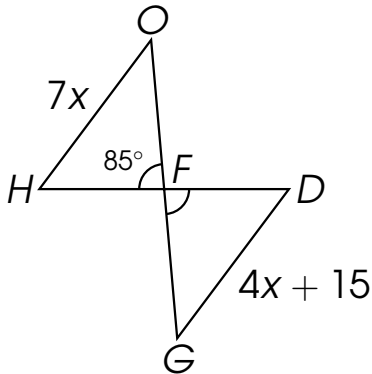


# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$\overline{OH} \cong$

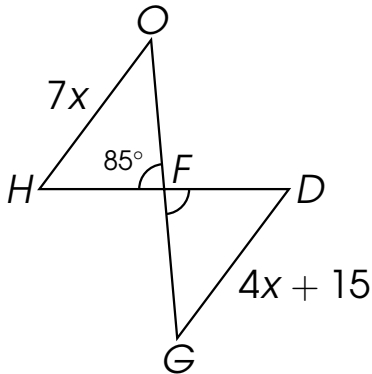


# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$



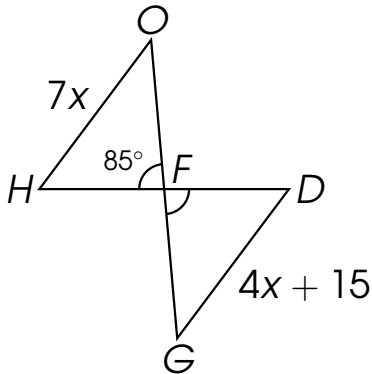
# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$





# Example 4

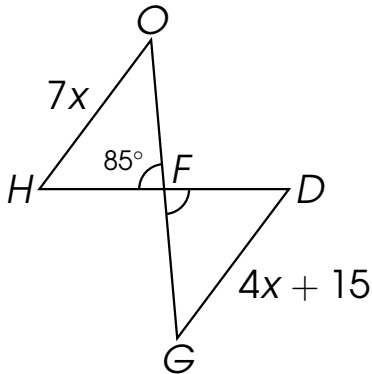
Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

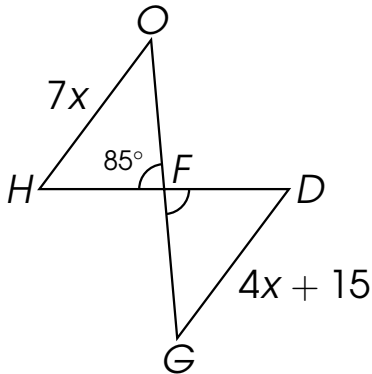
Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

$$7x - 4x = 4x - 4x + 15$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

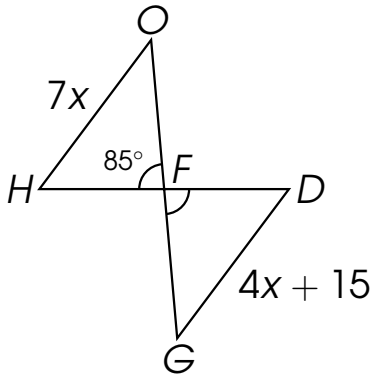
$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

$$7x - 4x = 4x - 4x + 15$$

$$3x = 15$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

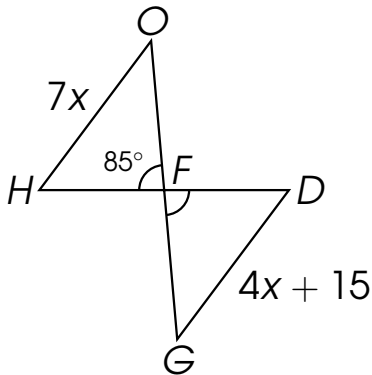
$$7x = 4x + 15$$

$$7x - 4x = 4x - 4x + 15$$

$$3x = 15$$

$$3x = 15$$

$$\frac{3x}{3} = \frac{15}{3}$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

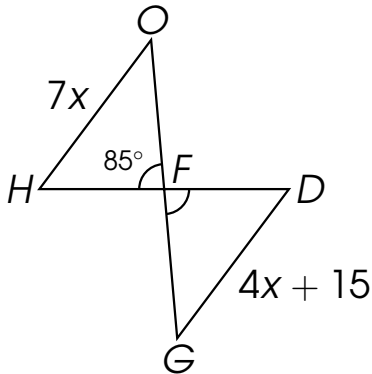
$$7x - 4x = 4x - 4x + 15$$

$$3x = 15$$

$$3x = 15$$

$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

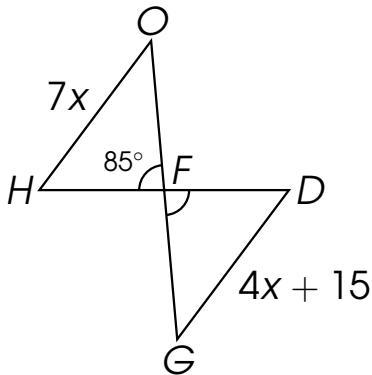
$$7x - 4x = 4x - 4x + 15$$

$$3x = 15$$

$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$

$$m\overline{OH} = 7x$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

$$7x - 4x = 4x - 4x + 15$$

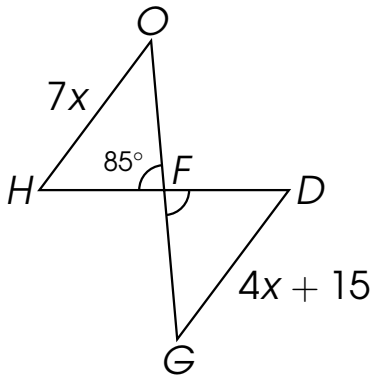
$$3x = 15$$

$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$

$$m\overline{OH} = 7x$$

$$m\overline{OH} = 7(5)$$



# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$$\overline{OH} \cong \overline{GD}$$

$$m\overline{OH} = m\overline{GD}$$

$$7x = 4x + 15$$

$$7x - 4x = 4x - 4x + 15$$

$$3x = 15$$

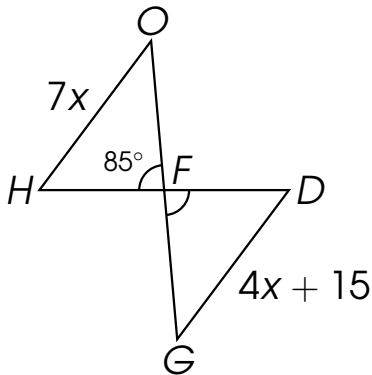
$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$

$$m\overline{OH} = 7x$$

$$m\overline{OH} = 7(5)$$

$$m\overline{OH} = 35 \text{ units}$$

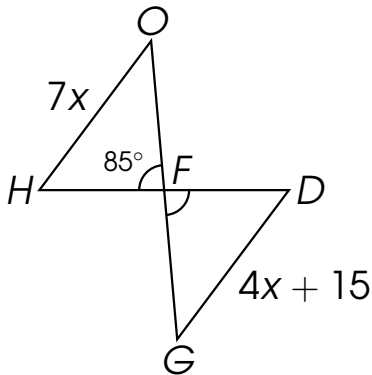




# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

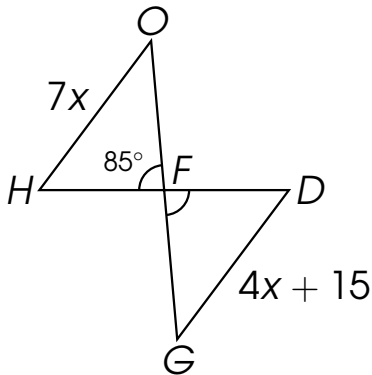


# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$\angle DFG \cong$

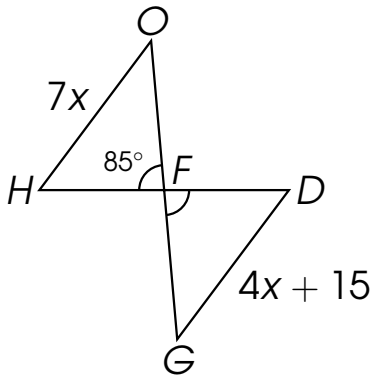


# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\overline{OH}$  and  $m\angle DFG$

$\angle DFG \cong \angle HFO$



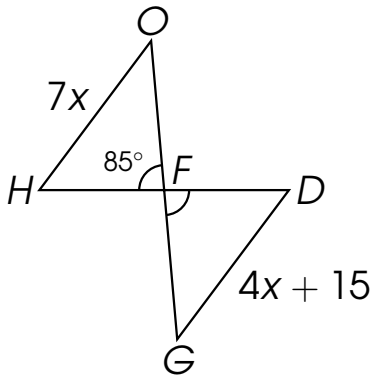
# Example 4

Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\angle OH$  and  $m\angle DFG$

$$\angle DFG \cong \angle HFO$$

$$m\angle DFG = m\angle HFO$$



# Example 4

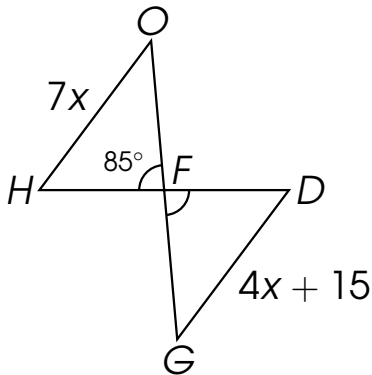
Given:  $\triangle OFH \cong \triangle GFD$

Find:  $m\angle OH$  and  $m\angle DFG$

$$\angle DFG \cong \angle HFO$$

$$m\angle DFG = m\angle HFO$$

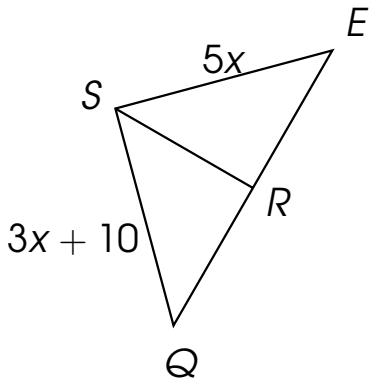
$$m\angle DFG = 85^\circ$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

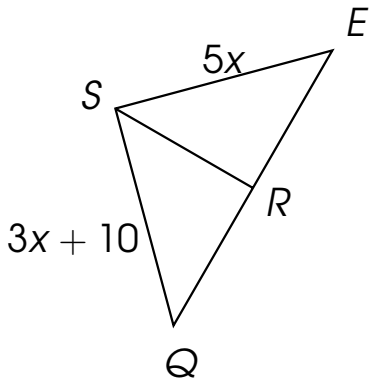


# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$\overline{SQ} \cong$

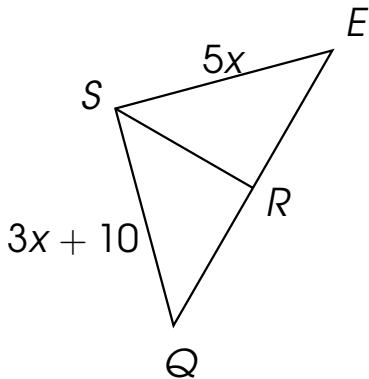


# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$





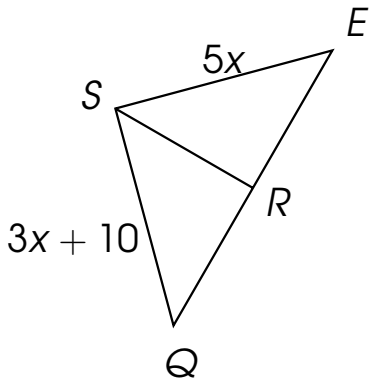
# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$



# Example 5

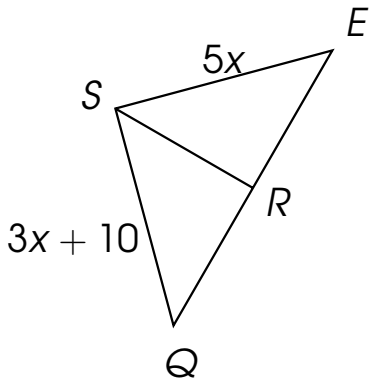
Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

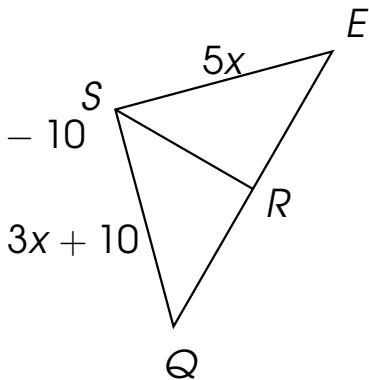
Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

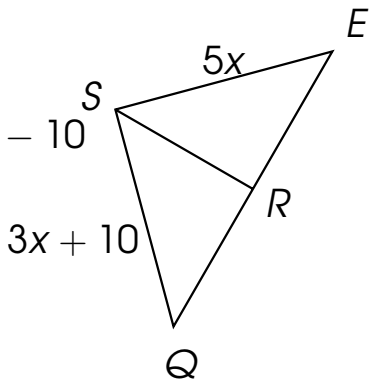
$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

$$-2x = -10$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

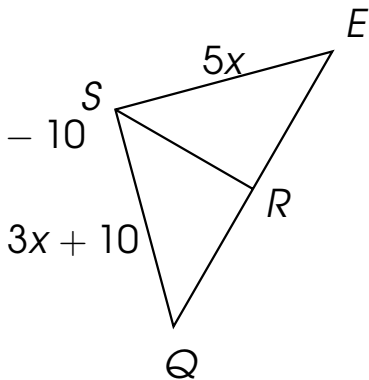
$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

$$-2x = -10$$

$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$$x = 5$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

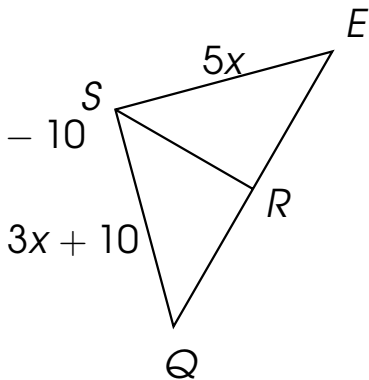
$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

$$-2x = -10$$

$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$$x = 5$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$

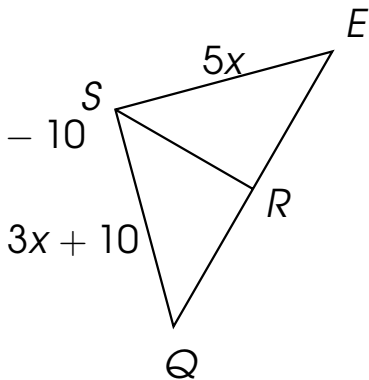
$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

$$-2x = -10$$

$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$$x = 5$$

$$m\overline{SQ} = 3x + 10$$



# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

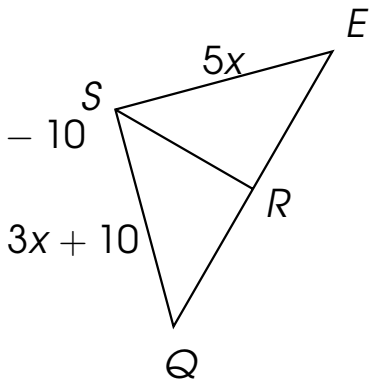
$$-2x = -10$$

$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$$x = 5$$

$$m\overline{SQ} = 3x + 10$$

$$m\overline{SQ} = 3(5) + 10$$





# Example 5

Given:  $\triangle ESR \cong \triangle QSR$

Find:  $m\overline{SQ}$

$$\overline{SQ} \cong \overline{SE}$$

$$m\overline{SQ} = m\overline{SE}$$

$$3x + 10 = 5x$$

$$3x - 5x + 10 - 10 = 5x - 5x - 10$$

$$-2x = -10$$

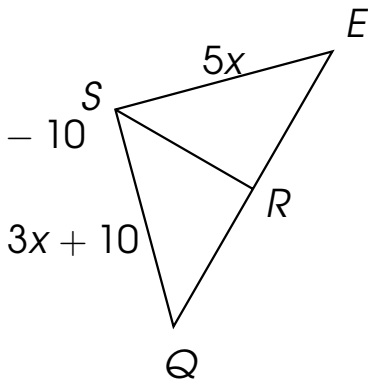
$$\frac{-2x}{-2} = \frac{-10}{-2}$$

$$x = 5$$

$$m\overline{SQ} = 3x + 10$$

$$m\overline{SQ} = 3(5) + 10$$

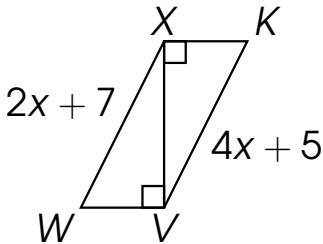
$$m\overline{SQ} = 25 \text{ units}$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

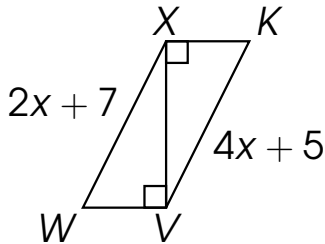


# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$\overline{XW} \cong$

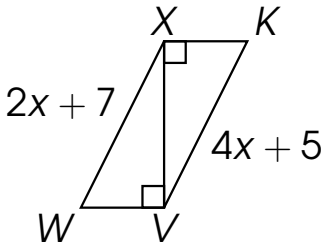


# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$



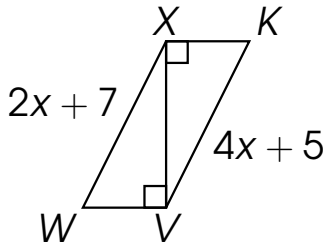
# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$



# Example 6

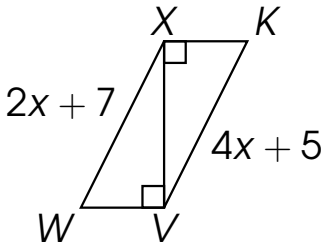
Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

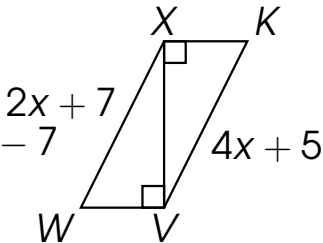
Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

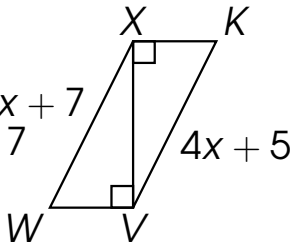
$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

$$-2x = -2$$





# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

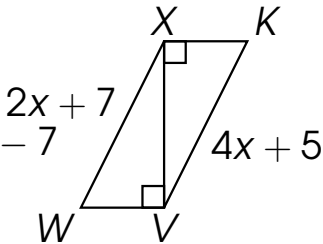
$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

$$-2x = -2$$

$$\frac{-2x}{-2} = \frac{-2}{-2}$$

$$x = 1$$



# Example 6

Given:  $\triangle XWV \cong \triangle VKX$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

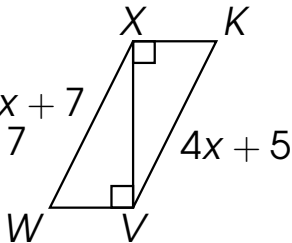
$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

$$-2x = -2$$

$$\frac{-2x}{-2} = \frac{-2}{-2}$$

$$x = 1$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$

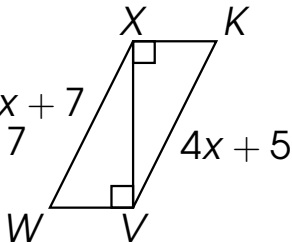
$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

$$-2x = -2$$

$$\frac{-2x}{-2} = \frac{-2}{-2}$$

$$x = 1$$

$$m\overline{XW} = 2x + 7$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

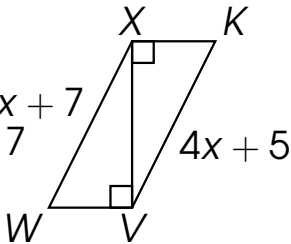
$$-2x = -2$$

$$\frac{-2x}{-2} = \frac{-2}{-2}$$

$$x = 1$$

$$m\overline{XW} = 2x + 7$$

$$m\overline{XW} = 2(1) + 7$$



# Example 6

Given:  $\triangle X VW \cong \triangle V X K$ ,  $m\angle W = 70^\circ$

Find:  $m\overline{XW}$  and  $m\angle K$

$$\overline{XW} \cong \overline{VK}$$

$$m\overline{XW} = m\overline{VK}$$

$$2x + 7 = 4x + 5$$

$$2x - 4x + 7 - 7 = 4x - 4x + 5 - 7$$

$$-2x = -2$$

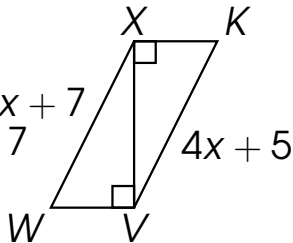
$$\frac{-2x}{-2} = \frac{-2}{-2}$$

$$x = 1$$

$$m\overline{XW} = 2x + 7$$

$$m\overline{XW} = 2(1) + 7$$

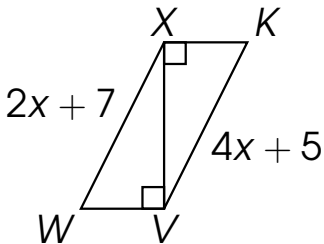
$$m\overline{XW} = 9 \text{ units}$$



# Example 6

Given:  $\triangle XVW \cong \triangle V XK$ ,  $m\angle W = 70^\circ$

Find:  $m\angle X$  and  $m\angle K$

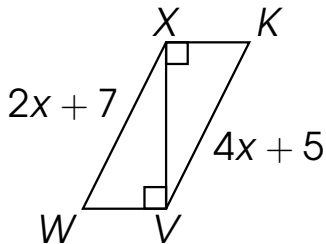


# Example 6

Given:  $\triangle XVW \cong \triangle VXK$ ,  $m\angle W = 70^\circ$

Find:  $m\angle XW$  and  $m\angle K$

$\angle K \cong$

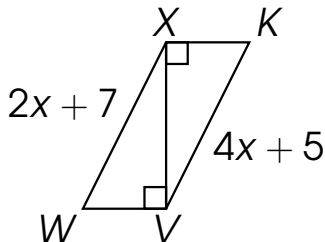


# Example 6

Given:  $\triangle XVW \cong \triangle VXK$ ,  $m\angle W = 70^\circ$

Find:  $m\angle X$  and  $m\angle K$

$$\angle K \cong \angle W$$





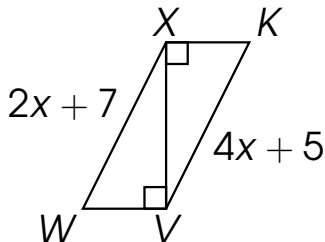
# Example 6

Given:  $\triangle XVW \cong \triangle V XK$ ,  $m\angle W = 70^\circ$

Find:  $m\angle X$  and  $m\angle K$

$$\angle K \cong \angle W$$

$$m\angle K = m\angle W$$



# Example 6

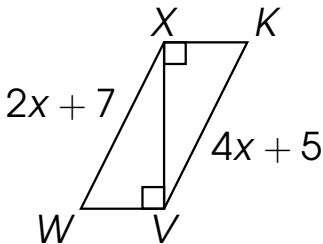
Given:  $\triangle XVW \cong \triangle V XK$ ,  $m\angle W = 70^\circ$

Find:  $m\angle X$  and  $m\angle K$

$$\angle K \cong \angle W$$

$$m\angle K = m\angle W$$

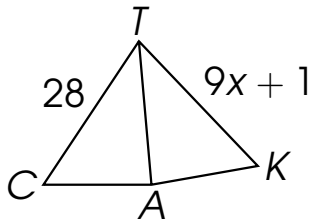
$$m\angle K = 70^\circ$$



# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

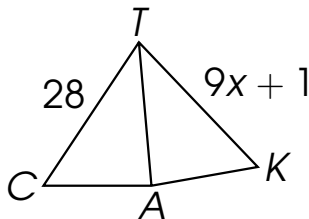


# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong$$

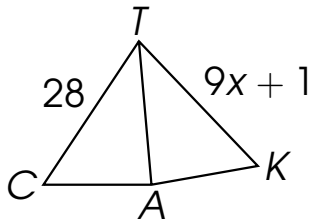


# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong \overline{TK}$$



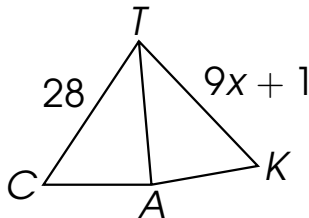
# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$



# Example 7

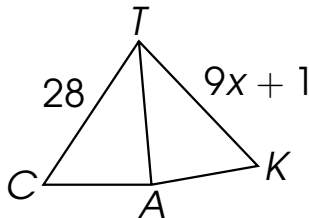
Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$

$$28 = 9x + 1$$



# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

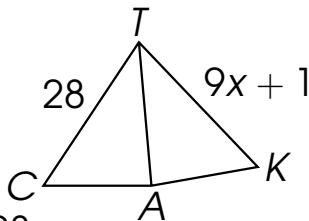
Find:  $x$

$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$

$$28 = 9x + 1$$

$$28 - 28 - 9x = 9x - 9x + 1 - 28$$





# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

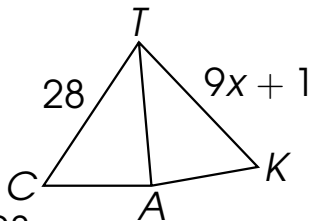
$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$

$$28 = 9x + 1$$

$$28 - 28 - 9x = 9x - 9x + 1 - 28$$

$$-9x = -27$$



# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$

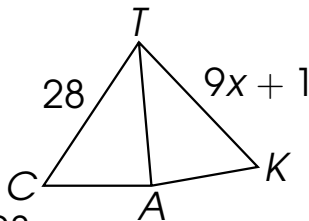
$$28 = 9x + 1$$

$$28 - 28 - 9x = 9x - 9x + 1 - 28$$

$$-9x = -27$$

$$\frac{-9x}{-9} = \frac{-27}{-9}$$

$$x = 3$$



# Example 7

Given:  $\triangle TAC \cong \triangle TAK$

Find:  $x$

$$\overline{TC} \cong \overline{TK}$$

$$m\overline{TC} = m\overline{TK}$$

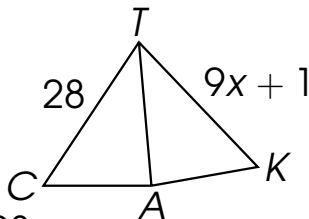
$$28 = 9x + 1$$

$$28 - 28 - 9x = 9x - 9x + 1 - 28$$

$$-9x = -27$$

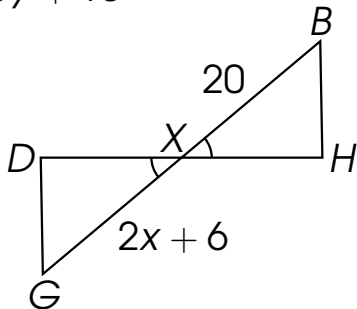
$$\frac{-9x}{-9} = \frac{-27}{-9}$$

$$x = 3$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

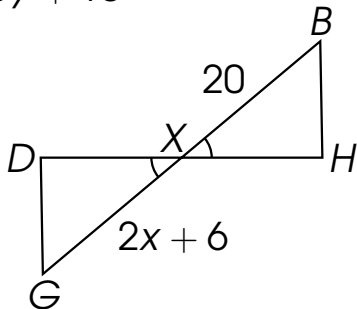


# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

$\overline{XG} \cong$

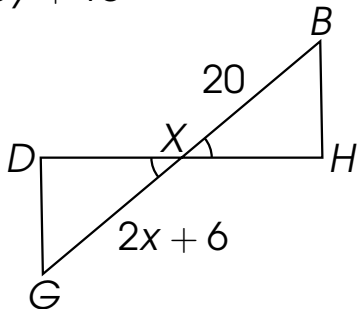


# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$



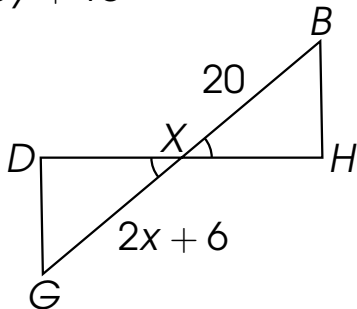
# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$



# Example 8

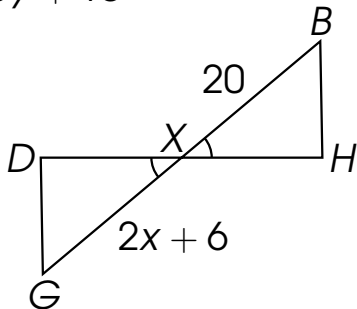
Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$

$$2x + 6 = 20$$





# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

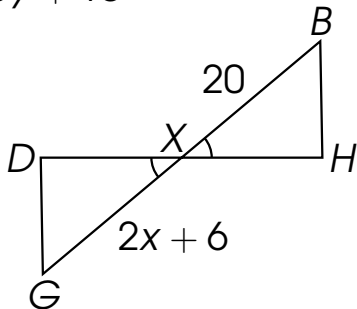
Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$

$$2x + 6 = 20$$

$$2x + 6 - 6 = 20 - 6$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

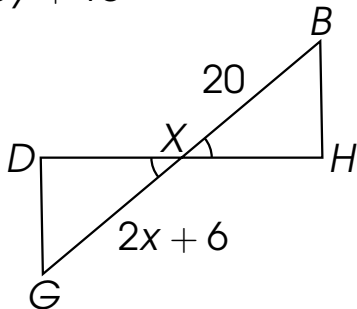
$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$

$$2x + 6 = 20$$

$$2x + 6 - 6 = 20 - 6$$

$$2x = 14$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$

Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$

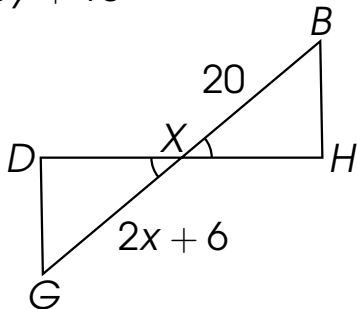
$$2x + 6 = 20$$

$$2x + 6 - 6 = 20 - 6$$

$$2x = 14$$

$$2x = 14$$

$$\frac{2x}{2} = \frac{14}{2}$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\overline{XG} \cong \overline{XB}$$

$$m\overline{XG} = m\overline{XB}$$

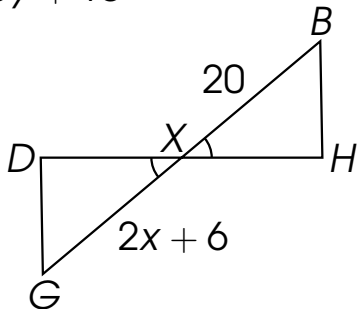
$$2x + 6 = 20$$

$$2x + 6 - 6 = 20 - 6$$

$$2x = 14$$

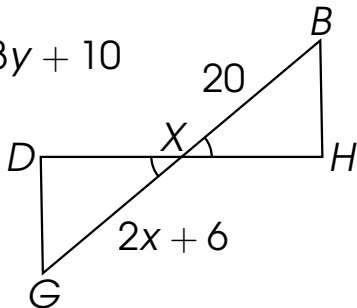
$$\frac{2x}{2} = \frac{14}{2}$$

$$x = 7$$



# Example 8

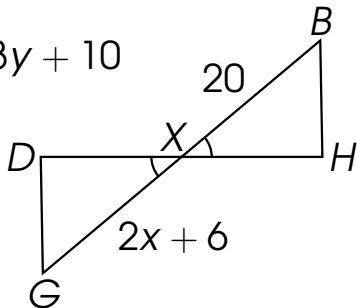
Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

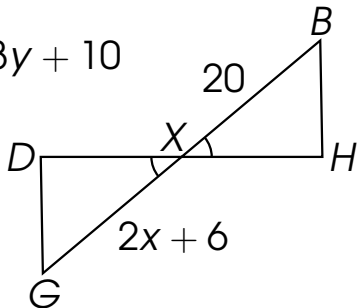
$\angle DXG \cong$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

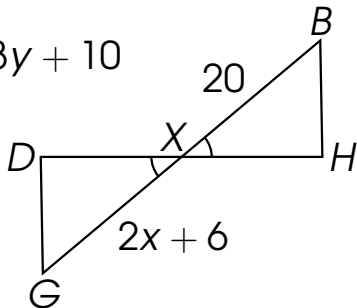
$$\angle DXG \cong \angle BXH$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\angle DXG \cong \angle BXH$$
$$m\angle DXG = m\angle BXH$$

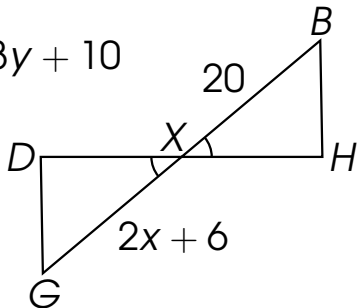




# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\begin{aligned}\angle DXG &\cong \angle BXH \\ m\angle DXG &= m\angle BXH \\ 3y + 10 &= y + 30\end{aligned}$$



# Example 8

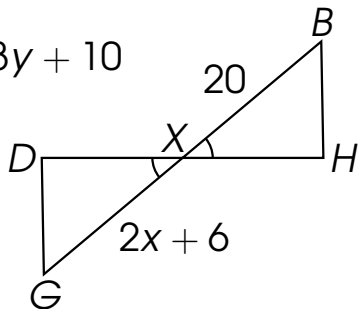
Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\angle DXG \cong \angle BXH$$

$$m\angle DXG = m\angle BXH$$

$$3y + 10 = y + 30$$

$$3y - y + 10 - 10 = y - y + 30 - 10$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

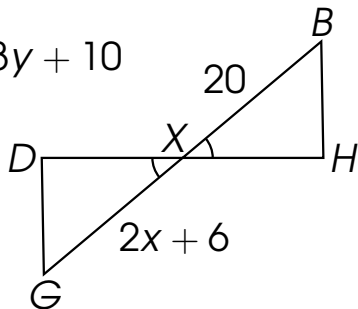
$$\angle DXG \cong \angle BXH$$

$$m\angle DXG = m\angle BXH$$

$$3y + 10 = y + 30$$

$$3y - y + 10 - 10 = y - y + 30 - 10$$

$$2y = 20$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\angle DXG \cong \angle BXH$$

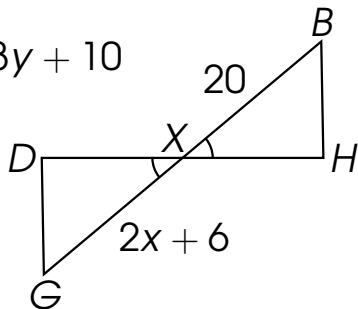
$$m\angle DXG = m\angle BXH$$

$$3y + 10 = y + 30$$

$$3y - y + 10 - 10 = y - y + 30 - 10$$

$$2y = 20$$

$$\frac{2y}{2} = \frac{20}{2}$$



# Example 8

Given:  $\triangle BXH \cong \triangle GXD$ ,  
 $m\angle BXH = y + 30$ ,  $m\angle DXG = 3y + 10$   
Find:  $x$  and  $y$

$$\angle DXG \cong \angle BXH$$

$$m\angle DXG = m\angle BXH$$

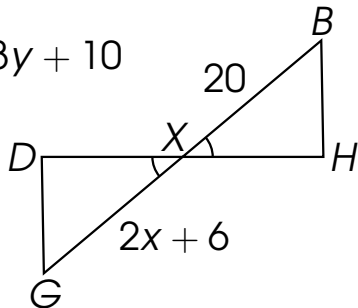
$$3y + 10 = y + 30$$

$$3y - y + 10 - 10 = y - y + 30 - 10$$

$$2y = 20$$

$$\frac{2y}{2} = \frac{20}{2}$$

$$y = 10$$

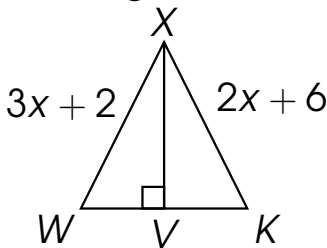


# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

$V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



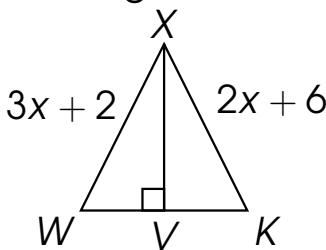
# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

$V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$

$$\overline{XW} \cong$$



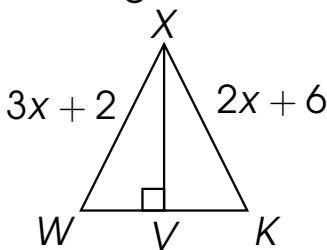
# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

$V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$

$$\overline{XW} \cong \overline{XK}$$





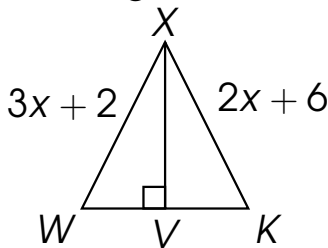
# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$

$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$



# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

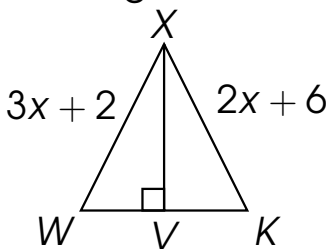
$V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$

$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$



# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

$V$  is the midpoint of  $\overline{WK}$

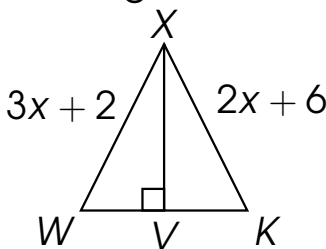
Find:  $m\overline{WV}$

$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$



# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$

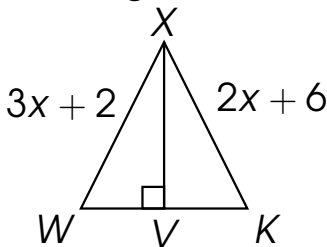
$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

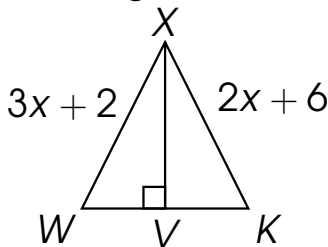
$$x = 4$$



# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

$$x = 4$$

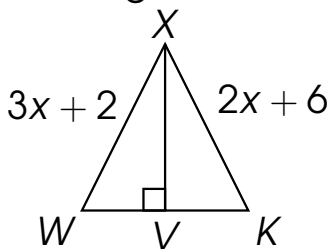
$$m\overline{WV} = \frac{1}{2}m\overline{WK}$$

# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,

$V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

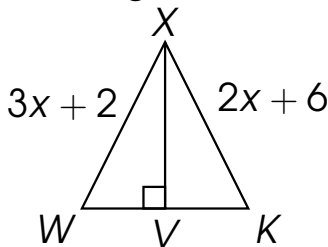
$$x = 4$$

$$m\overline{WV} = \frac{1}{2}m\overline{WK} = \frac{1}{2}(2x + 6)$$

# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

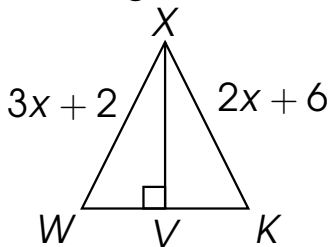
$$x = 4$$

$$m\overline{WV} = \frac{1}{2}m\overline{WK} = \frac{1}{2}(2x + 6) = \frac{1}{2}(2(4) + 6)$$

# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

$$x = 4$$

$$m\overline{WV} = \frac{1}{2}m\overline{WK} = \frac{1}{2}(2x + 6) = \frac{1}{2}(2(4) + 6)$$

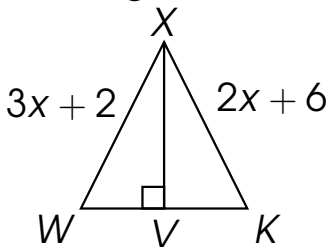
$$m\overline{WV} = \frac{1}{2}(14)$$



# Example 9

Given:  $\triangle XWK$  is an equilateral triangle,  
 $V$  is the midpoint of  $\overline{WK}$

Find:  $m\overline{WV}$



$$\overline{XW} \cong \overline{XK}$$

$$m\overline{XW} = m\overline{XK}$$

$$3x + 2 = 2x + 6$$

$$3x - 2x + 2 - 2 = 2x - 2x + 6 - 2$$

$$x = 4$$

$$m\overline{WV} = \frac{1}{2}m\overline{WK} = \frac{1}{2}(2x + 6) = \frac{1}{2}(2(4) + 6)$$

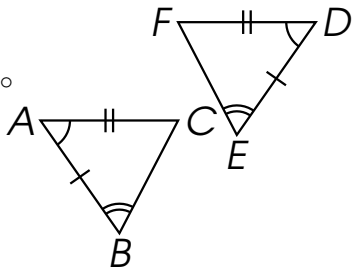
$$m\overline{WV} = \frac{1}{2}(14) = 7 \text{ units}$$

# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$



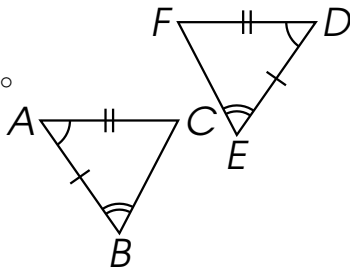
# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$\angle C \cong$



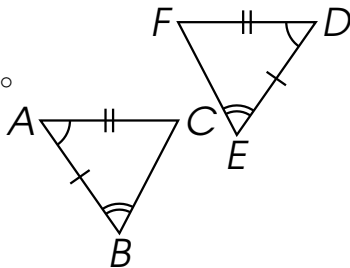
# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$\angle C \cong \angle F$



# Example 10

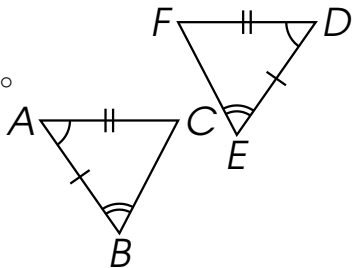
Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$\angle C \cong \angle F$

$m\angle C = m\angle F$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

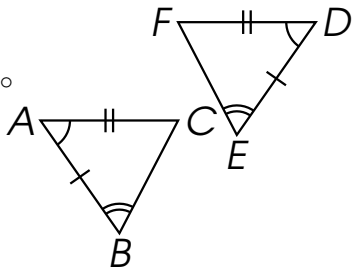
$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle C \cong \angle F$$

$$m\angle C = m\angle F$$

$$m\angle C = 60^\circ$$



# Angle Sum Theorem

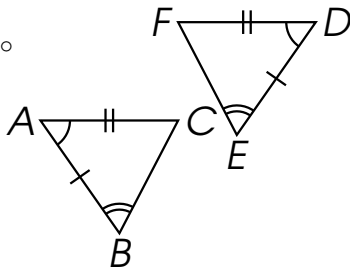
The angle measures in any triangle add up to  $180^\circ$ .

# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$





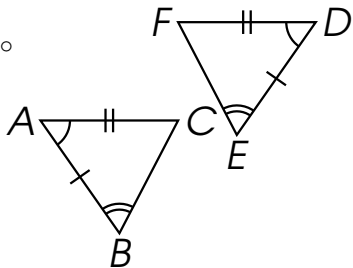
# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$m\angle A + m\angle B + m\angle C = 180^\circ$$



# Example 10

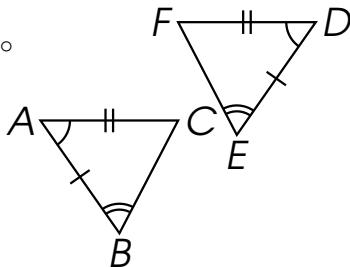
Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$$m\angle E = 3x - 5$$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$m\angle A + m\angle B + m\angle C = 180^\circ$$

$$50^\circ + m\angle B + 60^\circ = 180^\circ$$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

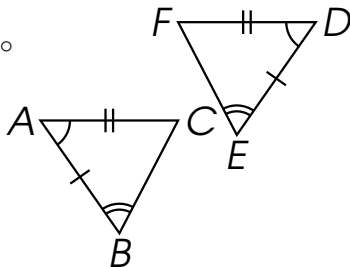
$$m\angle E = 3x - 5$$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$m\angle A + m\angle B + m\angle C = 180^\circ$$

$$50^\circ + m\angle B + 60^\circ = 180^\circ$$

$$110^\circ + m\angle B = 180^\circ$$

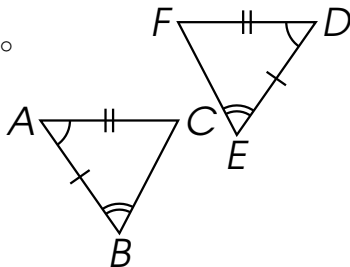


# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$



$$m\angle A + m\angle B + m\angle C = 180^\circ$$

$$50^\circ + m\angle B + 60^\circ = 180^\circ$$

$$110^\circ + m\angle B = 180^\circ$$

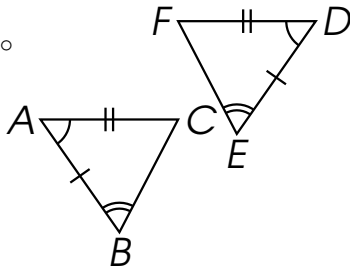
$$110^\circ - 110^\circ + m\angle B = 180^\circ - 110^\circ$$

# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$



$$m\angle A + m\angle B + m\angle C = 180^\circ$$

$$50^\circ + m\angle B + 60^\circ = 180^\circ$$

$$110^\circ + m\angle B = 180^\circ$$

$$110^\circ - 110^\circ + m\angle B = 180^\circ - 110^\circ$$

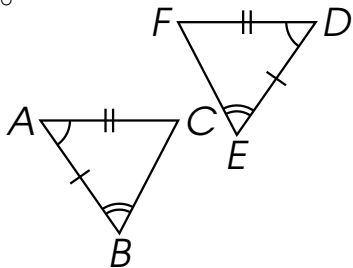
$$m\angle B = 70^\circ$$

# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$



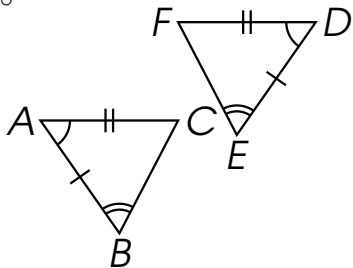
# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$\triangle ABC \cong$



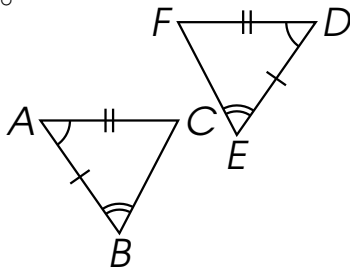
# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle E \cong \angle B$$





# Example 10

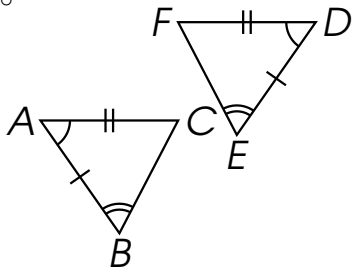
Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$\angle E \cong \angle B$

$m\angle E = m\angle B$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

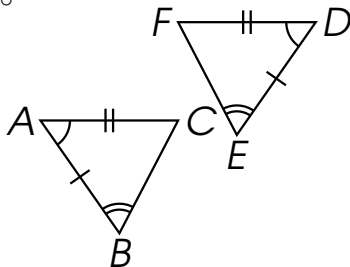
$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle E \cong \angle B$$

$$m\angle E = m\angle B$$

$$3x - 5 = 70$$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

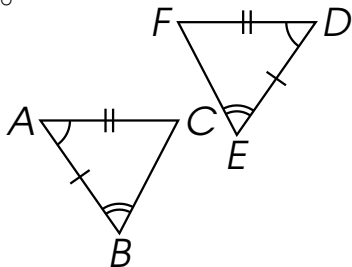
Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle E \cong \angle B$$

$$m\angle E = m\angle B$$

$$3x - 5 = 70$$

$$3x - 5 + 5 = 70 + 5$$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

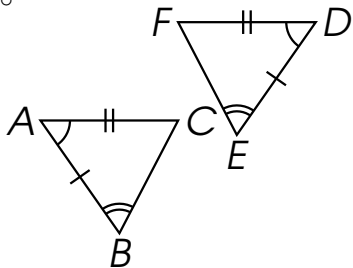
$$\angle E \cong \angle B$$

$$m\angle E = m\angle B$$

$$3x - 5 = 70$$

$$3x - 5 + 5 = 70 + 5$$

$$3x = 75$$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle E \cong \angle B$$

$$m\angle E = m\angle B$$

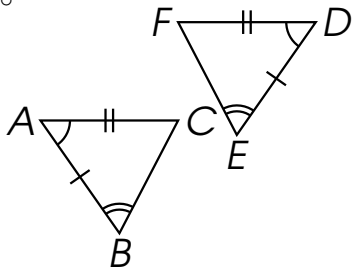
$$3x - 5 = 70$$

$$3x - 5 + 5 = 70 + 5$$

$$3x = 75$$

$$3x = 75$$

$$\frac{3x}{3} = \frac{75}{3}$$



# Example 10

Given:  $m\angle A = 50^\circ$ ,  $m\angle F = 60^\circ$

$m\angle E = 3x - 5$

Find:  $m\angle C$ ,  $m\angle B$ ,  $x$

$$\angle E \cong \angle B$$

$$m\angle E = m\angle B$$

$$3x - 5 = 70$$

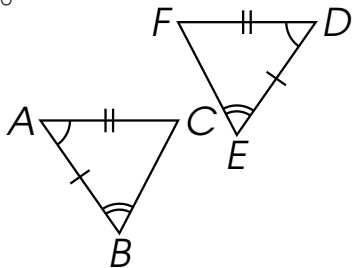
$$3x - 5 + 5 = 70 + 5$$

$$3x = 75$$

$$3x = 75$$

$$\frac{3x}{3} = \frac{75}{3}$$

$$x = 25$$



**Thank you for watching.**