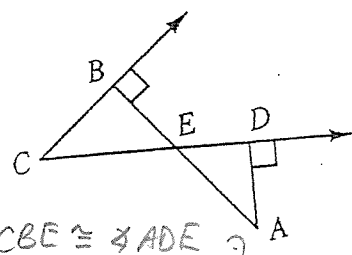


KFEY

Geometry (H)
Review 3.1 - 3.5

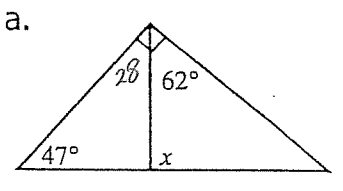
1. Given: $\overline{AB} \perp \overline{BC}$, $\overline{AD} \perp \overline{CD}$
Prove: $\angle A \cong \angle C$



- ① $\overline{AB} \perp \overline{BC}$
 $\overline{AD} \perp \overline{CD}$ } \rightarrow ② $\angle CBE$ & $\angle ADE$ are right \angle s \rightarrow ③ $\triangle CBE \cong \triangle ADE$
④ $\triangle BEC \cong \triangle DEA$ } \rightarrow ⑤ $\angle A \cong \angle C$

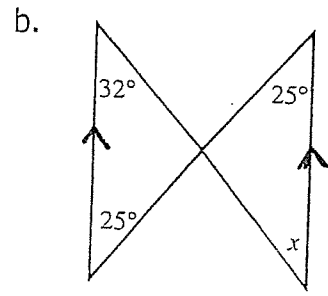
- ① Given
② \perp lines form right \angle s. ③ All right \angle s \cong .
④ Vertical \angle s \cong . ⑤ Corollary
If 2 \angle s of one \triangle are \cong to 2 \angle s of another \triangle , the 3rd pair \angle s \cong .

2. Find the value of x.

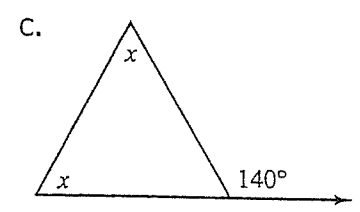


$47 + 28 = x$

$x = 75^\circ$



$x = 32^\circ$



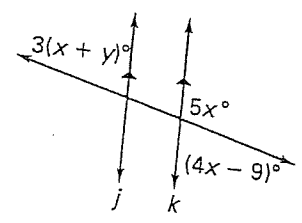
$2x = 140$
 $x = 70$

$x = 70^\circ$

3. Lines j and k are parallel. Find the value of x and y.

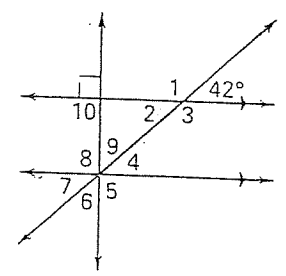
$3(x+y) = 4x - 9$
 $5x + 4x - 9 = 180$

$x = 21$
 $y = 4$

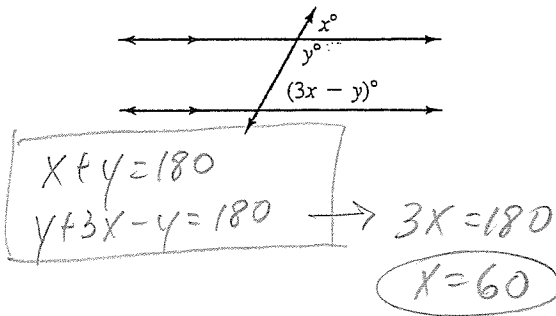


4. Find the measure of all labeled angles in the diagram.

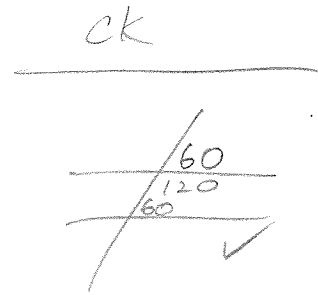
- $m\angle 1 = 138$ $m\angle 6 = 48$
 $m\angle 2 = 42$ $m\angle 7 = 42$
 $m\angle 3 = 138$ $m\angle 8 = 90$
 $m\angle 4 = 42$ $m\angle 9 = 48$
 $m\angle 5 = 90$ $m\angle 10 = 90$



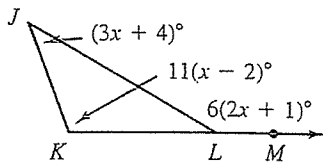
5. Find the values of x and y .



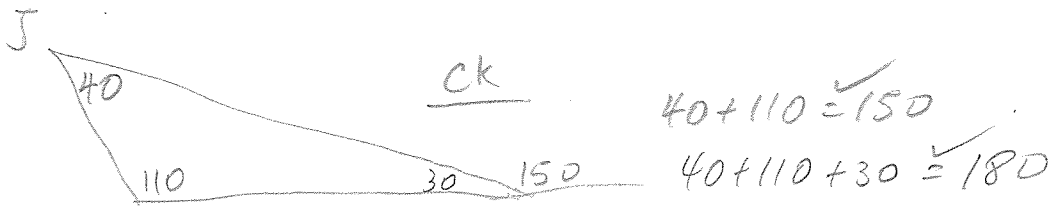
$x + y = 180$
 $60 + y = 180$
 $y = 120$



6. Find the measures of the interior angles of ΔJKL .



$6(2x + 1) = 3x + 4 + 11(x - 2)$
 $12x + 6 = 3x + 4 + 11x - 22$
 $24 = 2x$
 $12 = x$



7. Decide if the following statements are sometimes, always or never true. Justify your answer.

a. Two lines parallel to the same plane are skew. *Sometimes.*

parallel or skew

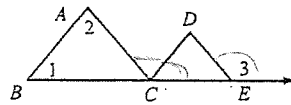
b. Two lines perpendicular to the same line are parallel. *Sometimes.*

only on a plane

c. Two lines perpendicular to the same plane intersect.

Never.
They are parallel.

8. Given: $\overline{AC} \parallel \overline{DE}$
 Prove: $m\angle 3 = m\angle 1 + m\angle 2$



① $\overline{AC} \parallel \overline{DE} \rightarrow$ ② $\angle 3 \cong \angle ACE \rightarrow$ ③ $m\angle ACE = m\angle 3$ ⑤
 ④ $m\angle 1 + m\angle 2 = m\angle ACE \rightarrow m\angle 1 + m\angle 2 = m\angle 3$

Reasons

- ① Given
 ② $\parallel \rightarrow$ corr. \angle s \cong
 ③ Def. of \cong \angle s
 ④ Ext. \angle Thm
 ⑤ transitive
 Meas. of ext. \angle = Sum of 2 remote inter. \angle s

9. One of the acute angles of a right triangle has measure that is 5 less than four times the measure of the other. Find the measures of the angles.

Let $x =$ one \angle
 $4x - 5 =$ other \angle

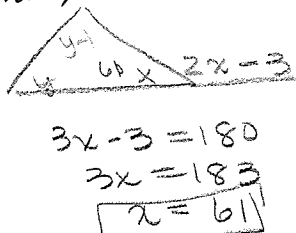


$x + 4x - 5 = 90$
 $5x = 95$
 $x = 19$

\angle s = 19, 71

10. The measure of an exterior angle of a triangle is 3 less than twice the measure of the adjacent interior angle. If the measures of the remote interior angles differ by 1, find the measure of each angle.

Let $x =$ adj. int. \angle
 $2x - 3 =$ ext. \angle
 $y =$ remote \angle
 $y - 1 =$ remote \angle



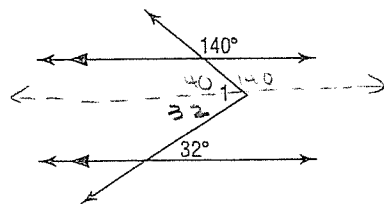
180
 -60
 120

$y + y - 1 = 119$
 $2y = 120$
 $y = 60$

60, 59

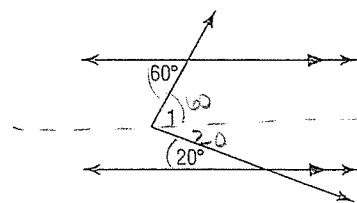
11. Find the $m\angle 1$ in each figure.

a.



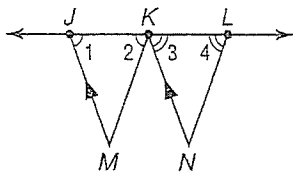
$m\angle 1 = 72$

b.



$m\angle 1 = 80$

12. Given: $\overline{JM} \parallel \overline{KN}$
 $\angle 1 \cong \angle 2$
 $\angle 3 \cong \angle 4$

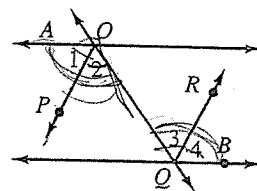


Prove: $\overline{KM} \parallel \overline{LN}$

① $\overline{JM} \parallel \overline{KN} \rightarrow$ ② $\angle 1 \cong \angle 3$ } ④
 ③ $\angle 1 \cong \angle 2$ } ⑤ $\angle 2 \cong \angle 3$ } ⑥
 $\angle 3 \cong \angle 4$ } $\angle 2 \cong \angle 4 \rightarrow \overline{KM} \parallel \overline{LN}$ ⑦

- ① Given
- ② $\parallel \rightarrow$ corr \angle s \cong
- ③ Given
- ④ transitive
- ⑤ Given
- ⑥ transitive
- ⑦ corr \angle s $\cong \Rightarrow \parallel$

13. Given: $\overline{AO} \parallel \overline{BQ}$
 \overline{OP} and \overline{OR} bisect $\angle AOQ$ and $\angle OQB$, respectively



Prove: $\angle 2 \cong \angle 4$

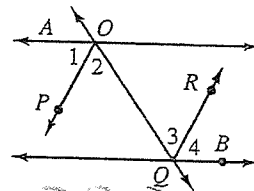
① $\overline{AO} \parallel \overline{BQ} \rightarrow$ ② $\angle AOQ \cong \angle BQO \rightarrow m\angle AOQ = m\angle BQO$ ③
 ④ \overline{OP} bis $\angle AOQ \rightarrow m\angle 2 = \frac{1}{2}m\angle AOQ \rightarrow 2(m\angle 2) = m\angle AOQ$ ⑤
 \overline{OR} bis $\angle OQB \rightarrow m\angle 4 = \frac{1}{2}m\angle BQO \rightarrow 2(m\angle 4) = m\angle BQO$ ⑥

⑦ $2(m\angle 2) = 2(m\angle 4) \rightarrow m\angle 2 = m\angle 4 \rightarrow \angle 2 \cong \angle 4$ ⑧

- ① Given
- ② $\parallel \rightarrow$ alt int \angle s \cong
- ③ Def $\cong \angle$ s
- ④ Given
- ⑤ \angle bis. Thm
- ⑥ Multiplication prop
- ⑦ substitution
- ⑧ Division
- ⑨ Def $\cong \angle$ s

14. Given: $\overline{AO} \parallel \overline{BQ}$; $\overline{OP} \parallel \overline{QR}$

Prove: $\angle 1 \cong \angle 4$



① $\overline{AO} \parallel \overline{BQ} \rightarrow \angle AOQ \cong \angle BQO \rightarrow m\angle AOQ = m\angle BQO$ ②
 $\overline{OP} \parallel \overline{QR} \rightarrow \angle 2 \cong \angle 4 \rightarrow m\angle 2 = m\angle 4$ ③
 $m\angle AOQ = m\angle 1 + m\angle 2$ ④
 $m\angle BQO = m\angle 3 + m\angle 4$ ⑤

⑥ $m\angle 1 + m\angle 3 = m\angle 3 + m\angle 4 \rightarrow m\angle 1 = m\angle 4$ ⑦
 $\angle 1 \cong \angle 4$ ⑧

- ① Given
- ② $\parallel \rightarrow$ alt int \angle s \cong
- ③ Def $\cong \angle$ s
- ④ Def $\cong \angle$ s
- ⑤ \angle Add Post
- ⑥ substitution
- ⑦ subtraction
- ⑧ Def $\cong \angle$ s