

KEY

Geometry (H)  
One Step Proofs

Soon you will be using your geometry knowledge to create proofs. Today, I want you to practice drawing conclusions from given statements. For each of the following problems, state what you can prove directly from the given statement and provide a reason (theorem, postulate, definition, property, etc.) for your conclusion.

Examples:

- a.  $\angle A$  complement  $\angle B$   $\therefore m\angle A + \angle B = 90^\circ$  Def. of complement *angles*
- b. Q is between A and B  $\therefore AQ + QB = AB$  Def. of between
- c.  $m\angle D + 40^\circ = m\angle V + 40^\circ \therefore m\angle D = m\angle V$  Subtraction property

Now it's your turn! Complete the following. (Hint: A drawing may be helpful.)

<u>GIVEN</u>	<u>CONCLUSION</u>	<u>REASON</u>
1. $\overrightarrow{CD}$ bisects $\angle BCR$	$\angle BCD \cong \angle DCR$	$\angle$ bisector divides an $\angle$ into 2 $\cong$ parts.
2. $\overline{AB} \cong \overline{CD}$ , $\overline{CD} \cong \overline{XY}$	$\overline{AB} \cong \overline{XY}$	Transitive Prop.
3. $\frac{1}{2} \angle A = 27^\circ$	$\angle A = 54^\circ$	Multiplication Prop.
4. $XY - 9 = ST - 9$	$XY = ST$	Addition Prop.
5. M midpoint $\overline{KR}$	$\overline{KM} \cong \overline{MR}$	A midpt divides a segment into 2 $\cong$ parts.
6. $\overline{ST} \perp \overline{TR}$	$m\angle STR$ is a right $\angle$	$\perp$ lines intersect to form right $\angle$ s.
7. $\angle X \cong \angle Y$	$m\angle X = m\angle Y$ or $\angle Y \cong \angle X$	Def: $\cong \angle$ s have = measures Symmetric prop.
8. $m\angle PTR = 90^\circ$	$\angle PTR$ is a rt $\angle$ .	Def: A right $\angle$ measures $90^\circ$
9. $PT = MR$ , $MR = 15$	$PT = 15$	Substitution Prop. or Transitive Prop.



linear pair - forms a straight line, supplementary & adjacent

cannot be "forms a linear pair"

Suppl.  $\angle$ s are 2  $\angle$ s that total  $180^\circ$

10.  $m\angle C + m\angle T = 180^\circ$

$\angle C$  supplements  $\angle T$

Substitution Prop.

11.  $m\angle A = 48^\circ, m\angle B = 48^\circ$

$m\angle A = m\angle B$

12. E is between D and F

$DE + EF = DF$

Def of between Seg Add Post.

13. B interior  $\angle ACS$



$\angle ACB + \angle BCS = \angle ACS$

Angle Add Post.

14.  $\angle 5$  and  $\angle 7$  vertical  $\angle$ s

$\angle 5 \cong \angle 7$  (Thm) Vertical  $\angle$ s  $\cong$ .

15.  $\angle 3$  and  $\angle 8$  right  $\angle$ s

$\angle 3 \cong \angle 8$  (Thm) All r  $\angle$ s  $\cong$ .

16.  $\angle F$  complement  $\angle G$

$m\angle F + m\angle G = 90^\circ$

Complementary  $\angle$ s are 2  $\angle$ s that total  $90^\circ$

17.  $\angle P$  complement  $\angle G$   
 $\angle K$  complement  $\angle G$

$\angle P \cong \angle K$  (Thm) If 2  $\angle$ s complement same  $\angle$ , they are  $\cong$  to each other.

18.  $m\angle 1 + m\angle 2 = 130$   
 $m\angle 1 = 50$

$50 + m\angle 2 = 130$

Substitution Prop.

19.  $\triangle RDH$  equilateral

$\overline{RD} \cong \overline{DH} \cong \overline{HR}$

Equil.  $\triangle$  has 3  $\cong$  sides

20.  $\angle GRS \cong \angle SRK$

$m\angle GRS = m\angle SRK$

$\cong \angle$ s have = measures.

21. Line m bisects  $\overline{ST}$  at W

$\overline{SW} \cong \overline{WT}$



or W is midpt of  $\overline{ST}$ .

A seg. bisector divides a seg into 2  $\cong$  parts

22.  $\angle 1$  supplement  $\angle X$

$m\angle 1 + m\angle X = 180^\circ$

Suppl.  $\angle$ s are 2  $\angle$ s that total  $180^\circ$ .

23.  $\angle A \cong \angle D, \angle D \cong \angle F$

$\angle A \cong \angle F$

Transitive Prop.

Substitution Prop.