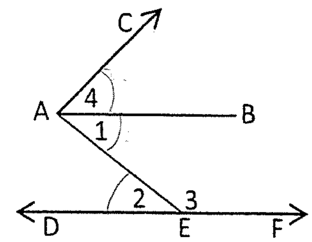
Geo (H)
Chapter 2 - TEST REVIEW ANSWER KEY

1. Write a flow proof for each of the following.

a. Given: $\overline{AB}$ bisects $\angle CAE$
$\angle 2 \cong \angle 4$

Prove: $\angle 1$ supplementary $\angle 3$



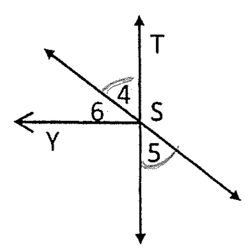
① $\overline{AB}$ bisects $\angle CAE$ → ② $\angle 4 \cong \angle 1$, ③ $\angle 2 \cong \angle 4$ → ④ $\angle 1 \cong \angle 2$

⑤ $\angle 2$ & $\angle 3$ are linear pair → ⑥ $\angle 2$ supplement $\angle 3$ → ⑦ $m\angle 2 + m\angle 3 = 180$

→ ⑧ $m\angle 1 + m\angle 3 = 180$ → ⑨ $\angle 1$ supplementary $\angle 3$

① Given
② Def. of angle bisector
③ Given
④ Transitive prop.
⑤ Def. of linear pair
⑥ Linear pair postulate
⑦ Def of supplement ∠s.
⑧ Substitution
⑨ Def of supplement angles

b. Given: $\overline{ST} \perp \overline{SY}$
Prove: $\angle 6$ complementary $\angle 5$



① $\overline{ST} \perp \overline{SY}$ → ② $\angle 4$ & $\angle 6$ are complementary angles → ③ $m\angle 4 + m\angle 6 = 90$

④ $\angle 4 \cong \angle 5$ → ⑤ $m\angle 4 = m\angle 5$

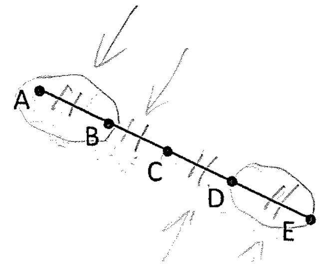
→ ⑥ $m\angle 5 + m\angle 6 = 90$ → ⑦ $\angle 6$ complement $\angle 5$

① Given
② If exterior sides form adj. acute ∠s, then ∠s. complementary.
③ Def of complement ∠s.
④ Vertical ∠s. ≅
⑤ Def. of congruent ∠s.
* ⑥ Substitution.
⑦ Def. of complement ∠s.

c. Given: B is the midpoint of $\overline{AC}$

D is the midpoint of $\overline{CE}$

$\overline{AB} \cong \overline{DE}$



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

(1) B midpt of $\overline{AC}$ → (2) $AB = BC$

(3) $\overline{AB} \cong \overline{DE}$ → (4) $AB = DE$

→ (5) $BC = DE$

(6) D midpt of $\overline{CE}$ → (7) $CD = DE$

→ (8) $BC = CD$

(9) $AB = DE$

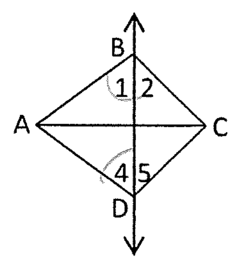
→ (10) $AB + BC = DE + CD$ → (11) $AC = CE$ → (12) $\overline{AC} \cong \overline{CE}$

(1) Given
(2) Def midpt
(3) Given
(4) Def ≅ seg.
(5) Transitive
(6) Given
(7) Def midpt
(8) Transitive
(9) reference #4
(10) Addition Property
(11) Seg Add Post.
(12) Def Seg Post.

d. Given: $\overline{AB} \perp \overline{BC}$; $\overline{AD} \perp \overline{CD}$

$\angle 1 \cong \angle 4$

Prove: $\angle 2 \cong \angle 5$



(1) $\overline{AB} \perp \overline{BC}$, $\overline{AD} \perp \overline{CD}$ → (2) ∡1 & ∡2 complementary ∡s, ∡4 & ∡5 complementary ∡s

(3) ∡1 ≅ ∡4

→ (4) ∡2 ≅ ∡5

(1) Given
(2) If exterior sides of ⊥ lines form adj. acute ∡s, then ∡s are complementary
(3) Given
(4) Congruent complements theorem

2. The sum of the measures of the supplement and complement of an angle is 184°. Find the measure of the angle, the complement and the supplement. (7 pts.)

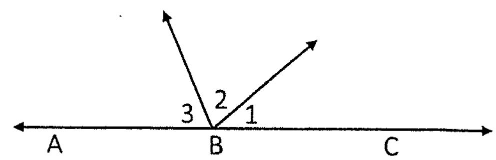
Let x = the angle
$180-x$ = the supplement
$90-x$ = the complement

$$180-x+90-x=184$$
$$270-2x=184$$
$$86=2x$$
$$43=x$$

angle = 43
complement = 47
supplement = 137

3. A, B and C are collinear. ∠1, ∠2 and ∠3 are in the ratio of 4 : 5 : 7. Find the measure of each angle. (6 pts.)

label!



m∠1 = 45
m∠2 = $\frac{225}{4}$
m∠3 = $\frac{315}{4}$

Let $4x = m\angle 1$
$5x = m\angle 2$
$7x = m\angle 3$

$$m\angle 1+m\angle 2+m\angle 3=180$$
$$4x+5x+7x=180$$
$$16x=180$$
$$x=11\tfrac{1}{4}$$
or
$$\frac{45}{4}$$

m∠1
$4x=4\left(\frac{45}{4}\right)$
$m\angle 1=45°$

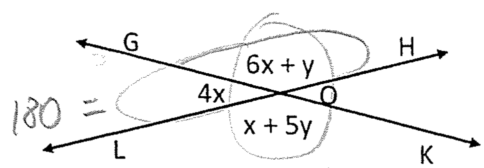
m∠2
$5x=5\left(\frac{45}{4}\right)$
$=\frac{225}{4}$

m∠3
$7x=7\left(\frac{45}{4}\right)$
$=\frac{315}{4}$

4. Find the measure of ∠GOL and ∠GOH. (7 pts.)

2 variables need 2 eq's!

Put system in a box!



vertical angles ≅

EQ#1: $6x+y=x+5y$
EQ#2: $4x+6x+y=180$

Now solve!
Substitution:
$$4x+6x+y=180$$
$$10x+y=180$$
$$y=180-10x$$

$$6x+y=x+5y$$
$$6x+(180-10x)=x+5(180-10x)$$
$$6x+180-10x=x+900-50x$$
$$-4x=720-49x$$
$$45x=720$$
$$x=16$$

$$y=180-160$$
$$y=20$$

$m\angle GOL=4x$
$=4(16)$
$=64$

$m\angle GOH=116$
$6x+y$
$6(16)+20$

5. Determine if the following statements are sometimes, always or never true. Justify your answer. (3 pts. Ea.)

a. Vertical angles are complementary. Sometimes

If vertical angles are each 45, then complementary 45 45

If any other measurement, then not complementary 120 30

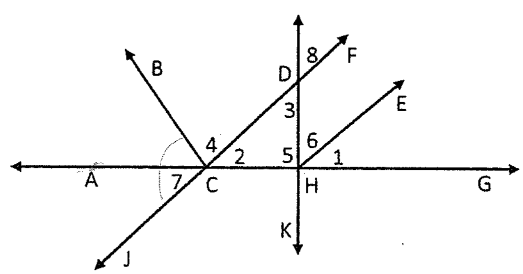
b. If ∠A is complementary to ∠B and ∠B complementary to ∠C, then ∠A is complementary to ∠C. Sometimes

A 45 B 45 C 45 A 70 B 20 ← The complement to ∡B is always 70°. Therefore, ∡A and ∡C will be the same measures, not complementary.

c. If ∠1 ≅ ∠2, then ∠1 and ∠2 are vertical angles. Sometimes

1 2 Not vertical 1 2 Not vertical 1 2

6. Using the diagram and the given information, draw a conclusion and give a reason **using only the theorems** from this chapter. (2 each, 5ox)



Given	Conclusion	Reason
∠1 complementary ∠6 ∠2 complementary ∠6	∡1 ≅ ∡2	Congruent Complements Thm.
$\overline{AC} \cong \overline{HG}$	$\overline{AH} \cong \overline{CG}$	Common segments Thm
$\overleftrightarrow{DK} \perp \overleftrightarrow{CG}$	∡5 & ∡DHG right ∡s.	⊥ lines form Right ∡s.
$\overrightarrow{HE}$ bisects ∠DHG	∡6 = ½ m∡DHG ∡1 = ½ m∡DHG	Angle bisector Thm
∠BCJ ≅ ∠ACD	∡7 ≅ ∡4	Common Angles Thm
∠3 and ∠8 are vertical	∡3 ≅ ∡8	Vertical ∡s ≅