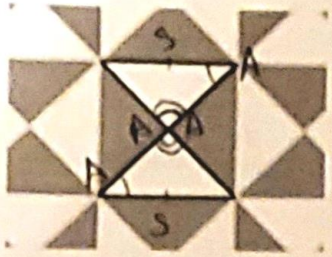
Geometry Quarter 2 Final Study Guide

Key

Can the triangles be proven congruent with the information given in the diagram? If so, state the congruency theorem/postulate you would use.

1. 

Vertical Angles Congruent

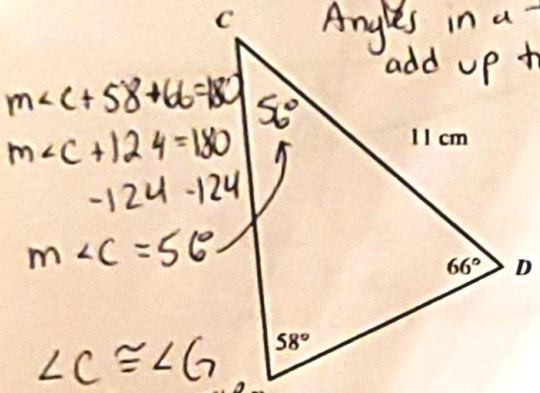
AAS proves triangles congruent

2. 

Yes, AAS proves triangles congruent

3. In the diagram, $\triangle CDE \cong \triangle GHI$. Find the value of y.

Triangle Sum Theorem
Angles in a triangle add up to 180°

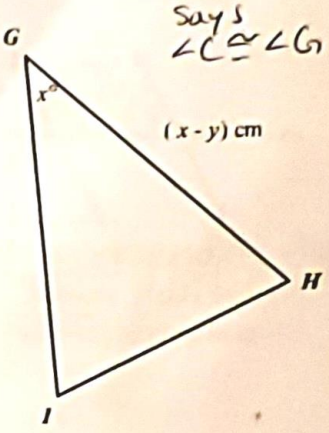


$m\angle C + 58 + 66 = 180$
$m\angle C + 124 = 180$
$-124 \quad -124$
$m\angle C = 56°$

$\angle C \cong \angle G$
$m\angle G = X = 56°$

$\boxed{X = 56}$

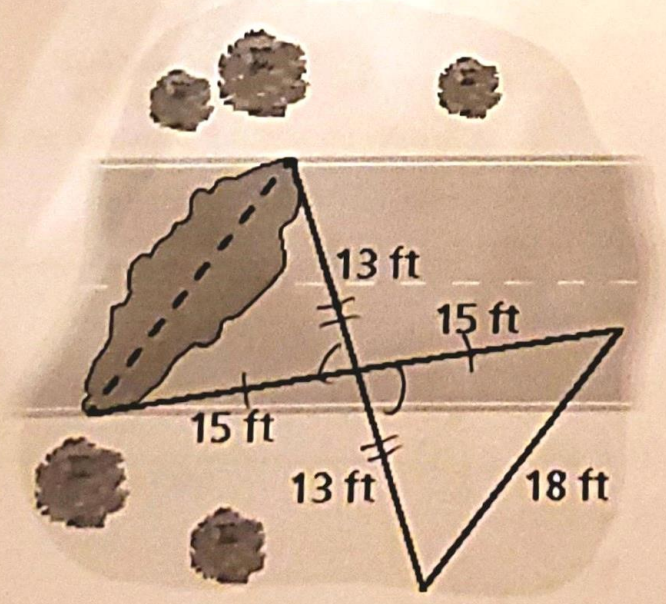
Order of the letters says $\angle C \cong \angle G$ and $\overline{CD} \cong \overline{GH}$



$11 = X - y$
$11 = (56) - y$
$-56 \quad -56$
$-45 = -y$
$\frac{-45}{-1} = \frac{-y}{-1}$

$\boxed{y = 45}$

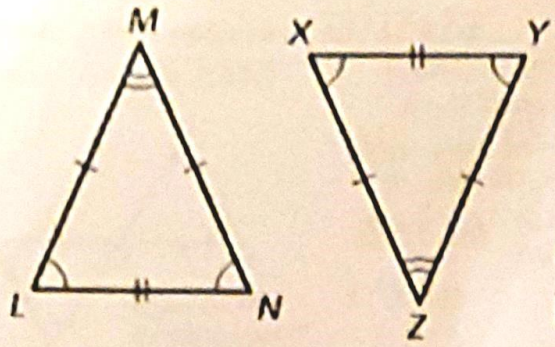
4. A road crew uses the triangles shown in the diagram to measure the width of a sink hole across a highway from a safe distance away. How wide is the sink hole?



Since vertical angles are congruent the two triangles are are congruent by SAS

the sink hole is 18 ft wide by CPCTC

5. Write a congruence statement for the triangles and all the congruent parts.



$\triangle LMN \cong \triangle YZX$ or $\triangle XZY$

Sides

$\overline{LM} \cong \overline{XZ} \cong \overline{YZ}$

$\overline{MN} \cong \overline{ZY} \cong \overline{ZX}$ } also congruent to each other

$\overline{LN} \cong \overline{XY} \cong \overline{YX}$

Angles

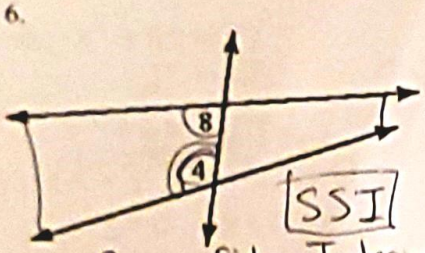
$\angle L \cong \angle Y \cong \angle X$

$\angle M \cong \angle Z$

$\angle N \cong \angle X \cong Y$

Classify the pair of numbered angles (AIA, AEA, Corr, SSI, SSE).

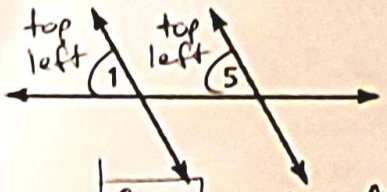
6.



SSI

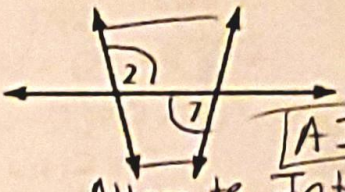
Same Side Interior
inside lines
same side of transversal

7.



Corresponding Angles
same position
different place

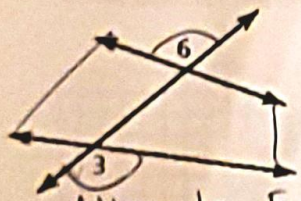
8.



AIA

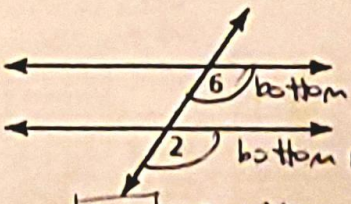
Alternate Interior Angles
inside lines
opposite sides of transversal

9.



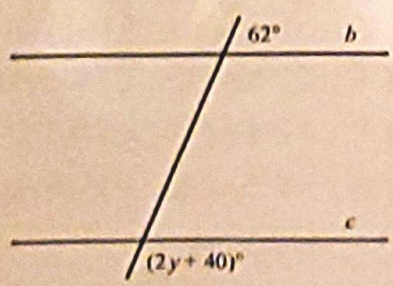
Alternate Exterior Angles
outside lines
opposite side of transversal

10.



Corresponding Angles

11. In the diagram, $b \parallel c$. Find the value of y.



Same Side Exterior Angles add up to 180

$2y + 40 + 62 = 180$

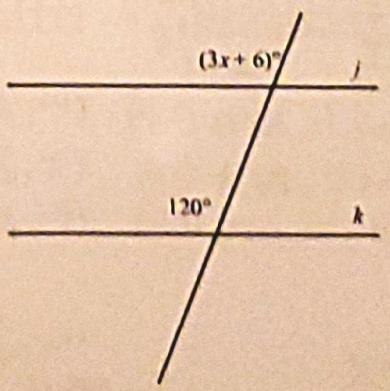
$2y + 102 = 180$

$-102 \quad -102$

$\frac{2y}{2} = \frac{78}{2}$

$y = 39$

12. Find the value of x that makes $j \parallel k$.



Corresponding Angles congruent

$3x + 6 = 120$

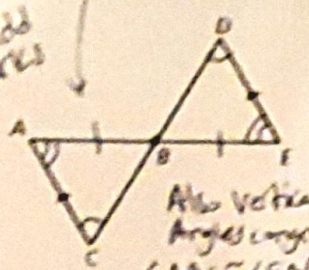
$-6 \quad -6$

$\frac{3x}{3} = \frac{114}{3}$

$x = 38$

Write a proof by listing the appropriate steps and postulate needed to prove the triangles congruent.

13. **Given** B is the midpoint of $\overline{AE}$, $\overline{AC} \parallel \overline{DE}$
Prove $\triangle ABC \cong \triangle EBD$



add marks

Parallel line Angle congruence

Alternate Interior Angles congruent

$\overline{AB} \cong \overline{EB}$ Def Midpoint

Also Vertical Angles congruent

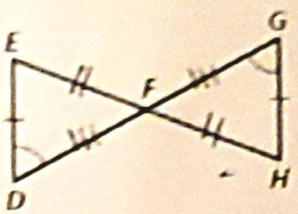
$\angle C \cong \angle D$

$\angle A \cong \angle E$

$\angle ABC \cong \angle EBD$

ASA $\cong$ or AAS Congruence

14. **Given** F is the midpoint of $\overline{EH}$ and $\overline{DG}$, $\angle D \cong \angle G, \overline{ED} \cong \overline{HG}$
Prove $\triangle DEF \cong \triangle GHF$



$\overline{EF} \cong \overline{HF}$ and $\overline{DF} \cong \overline{GF}$

and $\overline{ED} \cong \overline{HG}$

SSS congruence

SAS congruence $\angle G \cong \angle D$

or ASA Congruence $\angle GFH \cong \angle DFE$ Vertical Angles

Factor and solve.

15.) $x^2 + 6x = 27$

$-27 \quad -27$

$x^2 + 6x - 27 = 0$

$a=1$ $b=6$ $c=-27$

$(x-3)(x+9) = 0$

$x-3=0 \quad x+9=0$

$+3 \quad +3 \quad -9 \quad -9$

$x=3 \quad x=-9$

c: -27; $-3 \cdot 9$; 6; b: 6

16.) $w^2 - 16w + 8 = -40$

$+40 \quad +40$

$w^2 - 16w + 48 = 0$

$(w-4)(w-12) = 0$

$w-4=0 \quad w-12=0$

$+4 \quad +4 \quad +12 \quad +12$

$w=4 \quad w=12$

48; $-4 \cdot -12$; $+$; -16

1st) Get equation equal to 0

2nd) Find 2 #s that multiply to c and add to b

3rd) put those #s in the factors

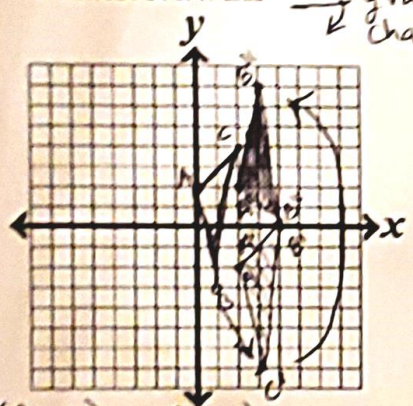
4th) Set each factor $=0$ Zero product property

5th) solve for variable

17. $A(0,2), B(1,-3), C(2,4)$

- $(x,y) \rightarrow (x+2, y-4)$
- Reflect over x-axis

y value changes



$\langle 2,-4 \rangle \quad (x,-y)$

$A(0,2) \rightarrow A'(2,-2) \rightarrow A''(2,2)$

$B(1,-3) \rightarrow B'(3,-7) \rightarrow B''(3,7)$

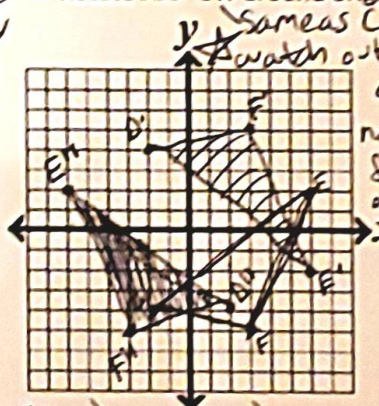
$C(2,4) \rightarrow C'(4,0) \rightarrow C''(4,0)$

18. $D(-2,-4), E(6,2), F(3,-5)$

- Reflect over x-axis
- Rotate 180° CW around origin

same as CCW watch out for direction

not same for 90° or 270°



$(x,-y) \quad (-x,-y)$

$D(-2,-4) D'(-2,4) \rightarrow D''(2,-4)$

$E(6,2) E'(6,-2) \rightarrow E''(-6,2)$

$F(3,-5) F'(3,5) \rightarrow F''(-3,-5)$

90° CCW

270° CW

Same thing so use 90° CCW rule

270° CCW

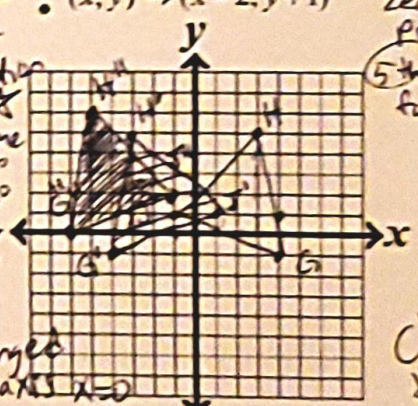
90° CW

Same thing so use 270° CCW rule

G(4,−1), H(3,5), J(−1,1)

- Reflect over line $x=0$
- $(x,y) \rightarrow (x-2, y+1)$

$x=0$ is the y axis



Changed y axis $x=0$

$(-x,+y) \quad \langle -2,1 \rangle$

$(4,-1) G'(4,-1) \rightarrow G''(-6,0)$

$(3,5) H'(3,-5) \rightarrow H''(-5,6)$

$(-1,1) J'(+1,+1) \rightarrow J''(-3,2)$

Changed to be different

has cool it looks like a reflection over y axis

$x=0$ y axis

$y=0$ x axis