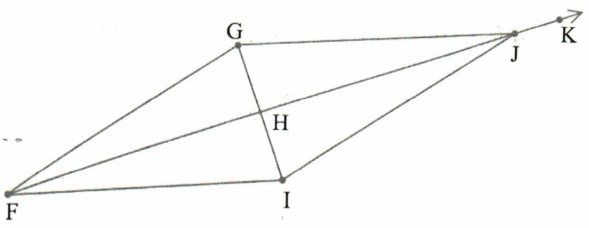
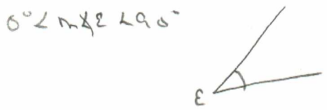
Naming and Notation: Unions and Intersections: Given each geometric figure below, write the requested name using appropriate symbols and notation according to each union and intersection.



1. $\overline{FG} \cap \overline{IG}$ = Point G
2. $\overline{FG} \cup \overline{FI}$ = ∠GFI
3. $\overline{FH} \cup \overline{HJ}$ = $\overrightarrow{FH}$ or $\overrightarrow{FJ}$
4. $\overrightarrow{FH} \cap \overrightarrow{HJ}$ = $\overrightarrow{HJ}$ or $\overrightarrow{HK}$
5. $\overrightarrow{FH} \cup \overrightarrow{HF}$ = $\overleftrightarrow{FH}$
6. $\overrightarrow{FH} \cap \overrightarrow{HJ}$ = $\overrightarrow{HJ}$ or $\overrightarrow{HK}$
7. $\overline{FH} \cup \overline{HI} \cup \overline{IF}$ = △FHI
8. $\overline{FH} \cap \overline{HI} \cap \overline{IF}$ = ∅

Sketch the following figures. Label all figures appropriately according to the name provided.

9. Acute $\measuredangle E$

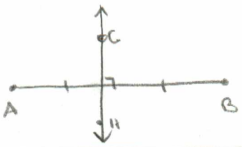


10. Straight $\measuredangle BCD$

11. $\overrightarrow{GH}$

12. Right $\measuredangle JKL$

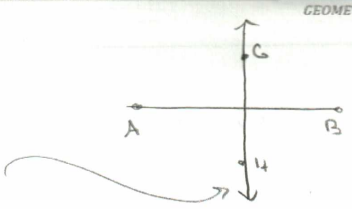
13. $\overleftrightarrow{GH}$ is the perpendicular bisector of $\overline{AB}$



14. ⊙ O with diameter $\overline{AB}$

Sketch the following figures:

15. In the space to the right, draw two points. Label the points A and B.



a. Draw the **set of all points equidistant** from A **and** B.
all points on ⊥ bisector of $\overline{AB}$

b. What is the **name** of the figure you drew in part a?
⊥ bisector of $\overline{AB}$

16. In the space to the right, draw one point. Label the points C.

a. Draw the **set of all points equidistant** from C.

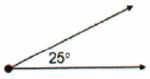
b. What is the **name** of the figure you drew in part a?
Circle C

Solve for the indicated variable or measures.

17. If the $m\angle A = 61°$, write the measure of its **complementary** angle.

$90 - 61 = 29°$

18. Given the angle below, write the measure of its **supplementary** angle.



$180 - 25°$
$155°$

19. If the measure of an angle is represented by $2x$:

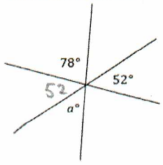
a. Circle the **expression** below that represents the measure of its complement?

(i) $180 - 2x$ (ii) $90 + 2x$ (iii) $90 - 2x$ (iv) $88x$

b. Write an **expression** for the supplement of the angle.

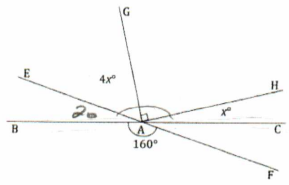
$180 - 2x$

20. **Solve** for a.



$180 - 78 - 52 = a$
$a = 50°$

21. **Solve** for x.



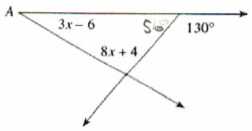
$4x + 90 + x + 20 = 180$

$5x + 110 = 180$

$5x = 70$

$x = 14$

22. Solve for x.



$3x - 6 + 8x + 4 = 130$ OR $3x - 6 + 8x + 4 + 50 = 180$

$11x - 2 = 130$ $11x + 48 = 180$

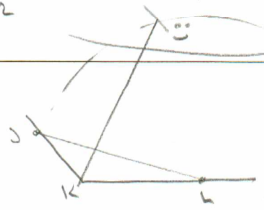
$11x = 132$ $11x = 132$

$x = 12$ $x = 12$

23. Sketch obtuse $\measuredangle JKL$.

a. Sketch in an angle bisector ray KM.

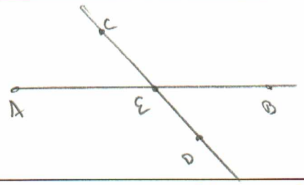
b. If $m\measuredangle JKM = 72°$, then $m\measuredangle JKL =$ 144°



24. $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at E. Sketch the figure.

If $m\measuredangle AEC = 5x - 20$ and $m\measuredangle BED = x + 50$

Then: $m\measuredangle CEB =$ 112.5



$5x - 20 = x + 50$

$4x = 70$

$x = 17.5$

25. The sum of the measures of angles x and y is 180°. The measure of angle x is 24° greater than the measure of angle y.

a. Define the variables and write a system of equation for this situation

b. **Solve the system** and find the measure of each angle.

$x + y = 180$

$x = 24 + y$

$24 + y + y = 180$

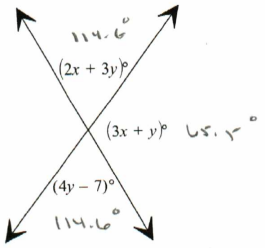
$2y = 156$

$y = 78$

$x \rightarrow$ measure 1st ∠ 102°

$y \rightarrow$ measure 2nd ∠ 78°

26. Use what you know about angle relationships to set up a system of equations. Then **solve for *x* and *y***.



$2x+3y+3x+y=180$ (supplements)

$2x+3y=4y-7$ (vertical)

$y=2x+7$

$5x+4y=180$

$5x+4(2x+7)=180$

$5x+8x+28=180$

$13x=152$

$x\approx 11.7$

$y=2(11.7)+7$

$y=30.4$

27. Select the best answer to the multiple-choice questions below.

4. Which illustration shows the correct construction of an angle bisector?

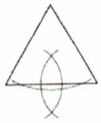
1)


2)

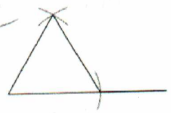

3)

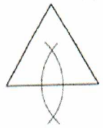

4)


3)

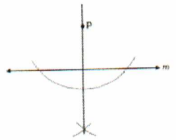

4)


5. Which diagram shows the construction of an equilateral triangle?

1)


2)


6. The diagram below shows the construction of a line through point *P* perpendicular to line *m*.



Which statement is demonstrated by this construction?

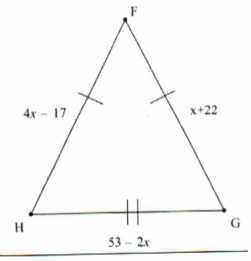
1) If a line is parallel to a line that is perpendicular to a third line, then the line is also perpendicular to the third line.
2) The set of points equidistant from the endpoints of a line segment is the perpendicular bisector of the segment.
3) Two lines are perpendicular if they are equidistant from a given point.
4) Two lines are perpendicular if they intersect to form a vertical line.

Isosceles △

28.

$4x-17 = x+22$
$3x = 39$
$x = 13$

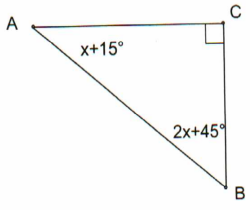
$x =$ 13
$FH =$ 35
$FG =$ 35
$HG =$ 27



29.

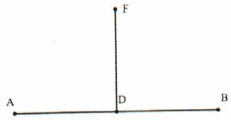
$x+15+2x+45 = 90$
$3x+60 = 90$
$x = 10$

$x =$ 10
$m\angle A =$ 25°
$m\angle B =$ 65°
$m\angle C =$ 90°



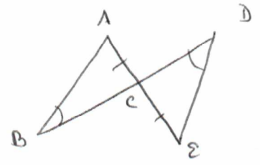
Write **reason** next to the appropriate statement in the right hand column.

30. Given: $\angle ADF = 90°, \angle BDF$ *is a right angle*
Prove: $\angle ADF \cong \angle BDF$



Statement	Reason
1) $\angle BDF$ *is a right angle*	1) given
2) $m\angle BDF = 90°$	2) definition of right ∠ all right ∠s have measure 90°
3) $m\angle ADF = 90°$	3) given
4) $m\angle BDF = m\angle ADF$	4) transitive
5) $\angle ADF \cong \angle BDF$	5) def ≅ angles

#38 a.



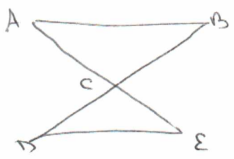
given $\overline{AE}$ bisects $\overline{BD}$
$\angle B \cong \angle D$

prove $\triangle ABC = \triangle EDC$

Statements	Reasons
1. $\overline{AE}$ bisects $\overline{BD}$, $\angle B \cong \angle D$	1. given
2. C is midpoint of $\overline{AE}$	2. def segment bisector (a line that intersects a segment at its midpoint)
3. $\overline{AC} \cong \overline{CE}$	3. a midpoint splits a segment into 2 $\cong$ segments
4. $\angle BCA \cong \angle DCE$	4. vertical $\angle$s are $\cong$
5. $\triangle ABC \cong \triangle EDC$	5. AAS

---

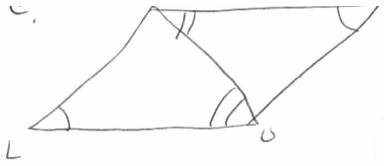
b.)



given : C is the midpoint of $\overline{BD}$ & $\overline{AE}$
prove : $\triangle ABC \cong \triangle EDC$

Statements	Reasons
1. C is midpoint of $\overline{BD}$ & $\overline{AE}$	1. given
2. $\overline{DC} \cong \overline{CB}$, $\overline{AC} \cong \overline{CE}$	2. midpoint divides a segment into 2 $\cong$ parts
3. $\angle ACB \cong \angle ECD$	3. vertical $\angle$s are $\cong$
4. $\triangle ABC \cong \triangle EDC$	4. SAS

c.



Prove: $\overline{ML} \cong \overline{ON}$

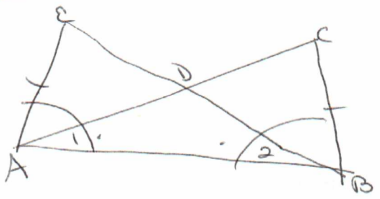
Statements	Reasons
1. $\angle L \cong \angle N$, $\angle LOM \cong \angle NMO$	1. given
2. $\overline{MN} \cong \overline{MN}$	2. reflexive prop $\cong$
3. $\triangle LOM \cong \triangle NMO$	3. AAS
4. $\overline{ML} \cong \overline{ON}$	4. Corresponding parts of $\cong \triangle$ are $\cong$

---

d. Same as b ???

---

e.

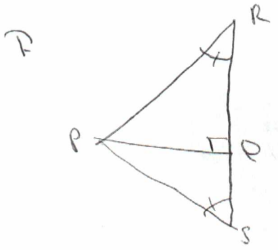


Given: $\overline{AE} \cong \overline{BC}$, $\angle EAB \cong \angle CBA$

Prove: $\angle 1 \cong \angle 2$

Statements	Reasons
1. $\overline{AE} \cong \overline{BC}$, $\angle EAB \cong \angle CBA$	1. given
2. $\overline{AB} \cong \overline{AB}$	2. reflexive prop $\cong$
3. $\triangle AEB \cong \triangle BCA$	3. SAS
4. $\angle 1 \cong \angle 2$	4. CPCTC

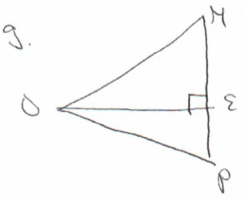
8.



Prove: $\triangle PQR \cong \triangle PQS$

Statements	Reasons
1. $\overline{PQ} \perp \overline{RS}$ $\angle R \cong \angle S$	1. given
2. $\overline{PQ} \cong \overline{PQ}$	2. reflexive prop $\cong$
3. $\angle PQR$ & $\angle PQS$ are right $\angle$s	2. $\perp$ lines form right $\angle$s
4. $\angle PQR \cong \angle PQS$	3. all right $\angle$s are $\cong$
5. $\triangle PQR \cong \triangle PQS$	4. AAS

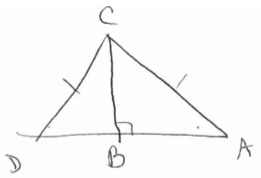
9.



Prove: $\triangle MOE \cong \triangle POE$

Statements	Reasons
1. $\overline{OE} \perp \overline{MP}$ $\overline{OE}$ bisects $\angle MOP$	1. given
2. $\angle OEM$ & $\angle OEP$ are right $\angle$s	2. $\perp$ lines form right $\angle$s
3. $\angle OEM \cong \angle OEP$	3. all right $\angle$s are $\cong$
4. $\angle MOE \cong \angle POE$	4. $\angle$ bisectors divides angle into $\angle \cong \angle$
5. $\overline{OE} \cong \overline{OE}$	5. reflexive prop $\cong$
6. $\triangle MOE \cong \triangle POE$	6. ASA

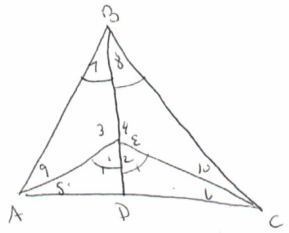
F2



Prove $\triangle DBC \cong \triangle ABC$

Statements	Reasons
1. $\angle ABC$ & $\angle DBC$ are right $\angle$s, $\overline{DC} \cong \overline{AC}$	1. given
2. $\triangle ACD$ is isosceles	2. an isosceles $\triangle$ has 2 $\cong$ sides
3. $\angle CDB \cong \angle CAB$	3. base $\angle$s of isosceles $\triangle$ are $\cong$
4. $\triangle DBC \cong ABC$	4. AAS

J2



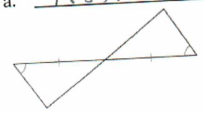
Prove $\angle 5 \cong \angle 6$

Statements	Reasons
1. $\angle 1 \cong \angle 2$ $\angle 7 \cong \angle 8$	1. given
2. $\angle 3$ supplementary $\angle 1$, $\angle 4$ supplementary $\angle 2$	2. 2 $\angle$s form a linear pair are supplementary
3. $\angle 3 \cong \angle 4$	3. supplements of $\cong$ $\angle$s are $\cong$
4. $\overline{BE} \cong \overline{BE}$	4. reflexive prop $\cong$
5. $\triangle BEA \cong \triangle BEC$	5. ASA
	6. corresponding parts of $\cong$ $\triangle$ are $\cong$

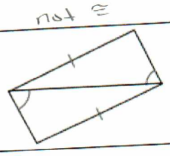
31. Determine if the triangles are congruent.

- If so, write the theorem (SAS, ASA, SSS, AAS, HL)
- If not, state "not congruent".

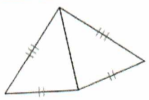
a. ASA



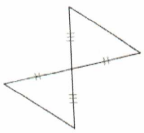
b. not ≅



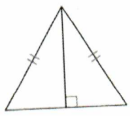
c. SSS



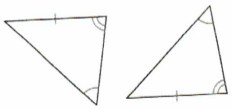
d. SAS



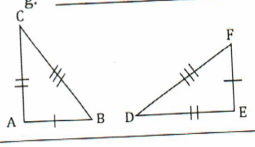
e. HL



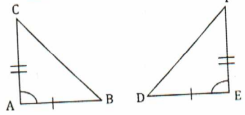
f. AAS



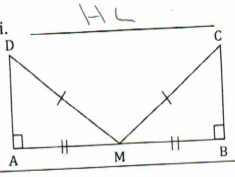
g. SSS



h. SAS



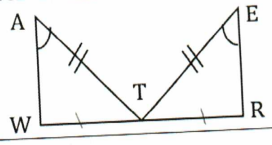
i. HL



For each pair of triangles, determine

- Are they congruent
- Write the triangle congruency statement
- Give the postulate that makes them congruent.
-

32. Given: T is the midpoint of $\overline{WR}$

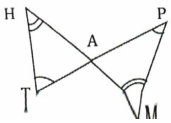


a. Yes (No)

b. Δ_____ ≅ Δ_____

c. _____ ASS

33.



a. Yes (No)

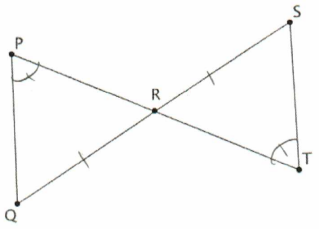
b. Δ_____ ≅ Δ_____

c. _____

37. Use the given information to mark the diagram. Then fill in the blank by writing the appropriate statement or reason for each step of the two-column proof.

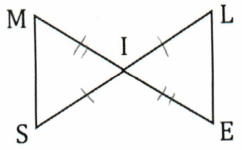
Given: $\measuredangle P \cong \measuredangle T$
R is the midpoint of $\overline{QS}$

Prove: $\Delta PQR \cong \Delta TSR$



1) $\measuredangle P \cong \measuredangle T$ *R is the midpoint of* $\overline{QS}$	1) given
2) $\overline{QR} \cong \overline{RS}$	2) *Definition of Midpoint*
3) $\angle PRQ \cong \angle TRS$ are vertical	3) *Definition of Vertical Angles (Given in diagram)*
4) $\measuredangle PRQ \cong \measuredangle TRS$	4) Vertical $\measuredangle$s are $\cong$
5) $\Delta PQR \cong \Delta TSR$	5) Δ AS

34. Given: I is the midpoint of $\overline{ME}$ and $\overline{SL}$

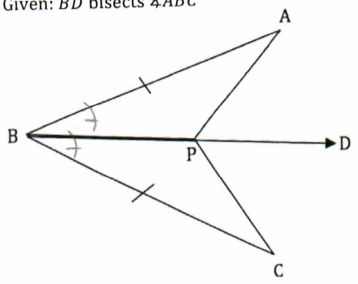


a. Yes No

b. Δ MIS $\cong \Delta$ EIL

c. SAS

35. Given: $\overrightarrow{BD}$ bisects $\angle ABC$

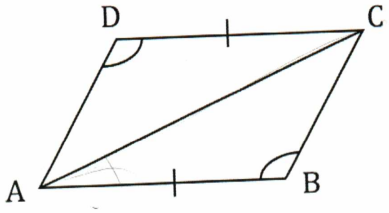


a. Yes No

b. Δ ABP $\cong \Delta$ CBP

c. SAS

36. The two triangles below are congruent by **Theorem ASA**.



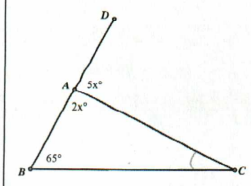
a. Which parts of the pair of triangles must be be shown congruent to satisfy ASA?

$\angle DCA \cong \angle CAB$

b. Write the congruence statement for the two triangles:

Δ DCA $\cong \Delta$ CAB

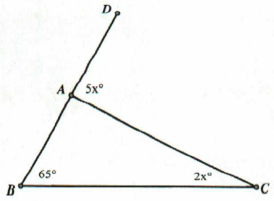
39. Find the measure of $\angle ACB$.



$5x+2x=180$
$7x=180$
$x=25.7$

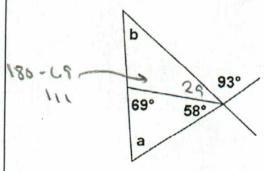
$180-(65+51.4)$
$\approx 63.6°$

40. Find the value of x.



$5x=2x+65$
$3x=65$
$x=21\frac{2}{3}$

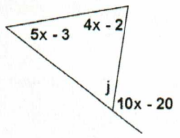
42. Find the value of a and b in the diagram below.



$180-69=111$

$180-69-58=a$
$c=53$
$180-111-29=b$
$b=40$

43. Find $m\angle j$



$5x-3+4x-2=10x-20$
$9x-5=10x-20$
$15=x$

$m\angle 1=180-(10.15-20)$
$=180-130$
$=50°$