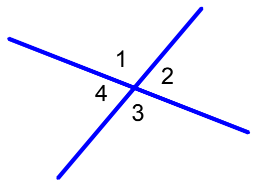
1. Supplementary Angles: 2 angles whose measures add to 180 degrees

2. Complementary Angles: 2 angles whose measures add to degrees

3. Vertical Angles: 2 nonadjacent angles that are formed by two intersecting lines (they are congruent)

<1 and <3 are vertical angles

<2 and <4 are vertical angles

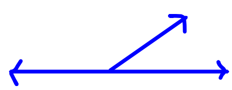


4. Transitive Property: If a=b and b=c, then a=c (a special type of substitution where you substitute a whole side)

5. Substitution Property: If a + b = c and a=d, then d + b = c.

6. Reflexive Property: When you say something is equal or congruent to itself (3 = 3, BC = BC, <1 ≅ <1)

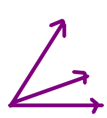
7. Linear Pair: 2 angles that are adjacent and supplementary (form a line)



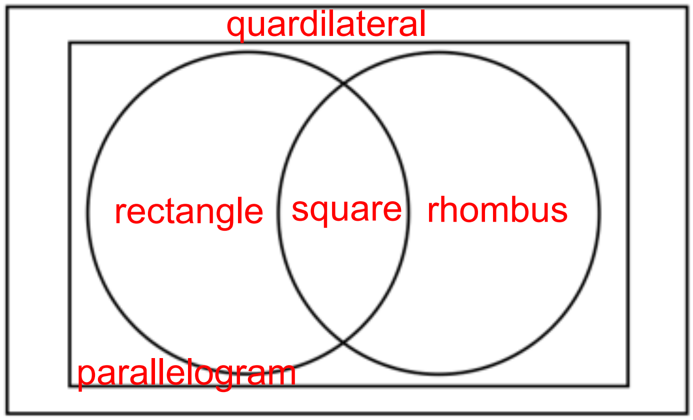
8. Subtraction Property: If a=b, then a-c=b-c (you can subtract the same thing from both sides of an equation and it is still equal)

9. Addition Property: If a=b, then a+c=b+c (you can add the same thing from both sides of an equation and it is still equal)

10. Adjacent Angles: 2 angles that share a common vertex and a common side (next to each other)



11.



Quadrilateral: A polygon with 4 sides (and 4 vertices)

Parallelogram: A quadrilateral with opposite sides parallel

Rectangle: A quadrialteral with all four angles congruent

Rhombus: A quadrialteral with all four sides congruent

Square: A quadrilateral with all four sides and all four angles congruent

Decide whether the statement is *sometimes, always,* or *never* true.

12. A rhombus is equilateral. Always

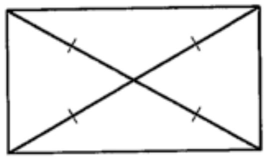
13. The diagonals of a rectangle are perpendicular. Sometimes

14. The opposite angles of a rhombus are supplementary. Sometimes

15. The diagonals of a rectangle bisect each other. Always

16. The consecutive angles of a square are supplementary Always

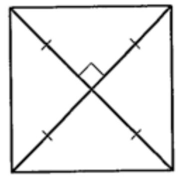
17.



Rectangle

(Diagonals Congruent)

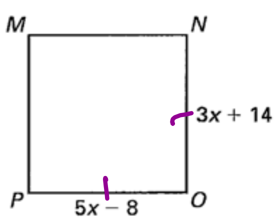
18.



Square

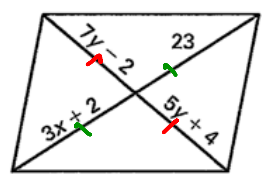
(Diagonals congruent and diagonals are perpendicular)

19.



$5x-8=\cancel{3x}+14$
$-3x \quad -\cancel{3x}$
$2x-\cancel{8}=14$
$+\cancel{8} \quad +8$
$\frac{\cancel{2}x}{\cancel{2}}=\frac{22}{2}$
$\boxed{x=11}$

20.



$7y-2=\cancel{5y}+4$
$-5y \quad -\cancel{5y}$
$2y-\cancel{2}=4$
$+\cancel{2} \quad +2$
$\frac{2y}{2}=\frac{6}{2}$
$\boxed{y=3}$

$3x+\cancel{2}=23$
$-\cancel{2} \quad -2$
$\frac{3x}{3}=\frac{21}{3}$
$\boxed{x=7}$

21. m<1: 64 deg (given)

m<2:116 deg (linear pair with <1, 180-64=116)

m<3: 116 deg (vertical to <2)

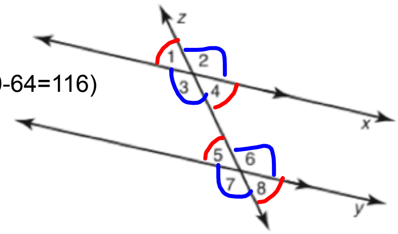
m<4: 64 deg (vertical to <1)

m<5: 64 deg (corresponding to <1)

m<6: 116 deg (corresponding to <2)

m<7: 116 deg (vertical to <6)

m<8: 64 deg (vertical to <8)



Recall:

Vertical angles (angles opposite each other) are congruent

Corresponding angles (angles in the same place of each intersection) are congruent

Linear Pair (2 angles that form a straight line) are supplementary (add to 180 degrees)

22. In the figure above list a pair of angles for the following terms:

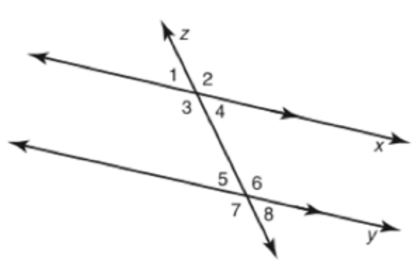
Alternate interior angles: <3 & <6, <4 & <5

Alternate exterior angles: <1 & <8, <2 & <7

Corresponding angles: <1 & <5, <2 & <6, <3 & <7, <4 & <8

Same-side interior angles: <3 & <5, <4 & <6

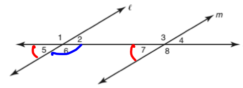
Same-side Exterior angles: <1 & <7, <2 & <8



23. Use the figure to prove the Same-Side Interior Angle Converse Theorem.

Given: ∠7 and ∠6 are supplementary.

Prove: $\ell \parallel m$



<7 & <6 supp — given

<5 & <6 — L.P.

m<7+m<6=180 — def of supp.

m<5+m<6=180 — L.P. Postulate

m<7 + m<6 = m<5 + m<6 — substitution

m<7 = m<5 — Subtraction

<7 ≅ <5 — DOCA

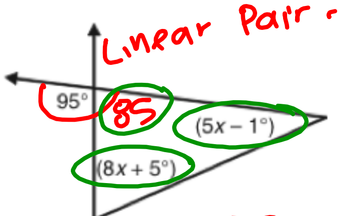
ℓ // m — Corresponding < converse Postulate

NOTE: corresponding angle converse postulate tells us IF corresponding angles are congruent THEN the lines are parallel.

we proved corresponding <'s (<5 & <7) are congruent so the lines are //.

24.

Linear Pair - add to 180



180 - 95 = 85

85 + 8x + 5 + 5x - 1 = 180

angles of a Δ add to 180.

13x + 89 = 180

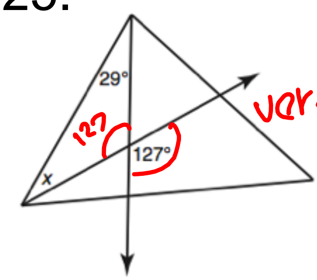
-89 -89

13x = 91

$\frac{13x}{13} = \frac{91}{13}$

$\boxed{x = 7}$

25.

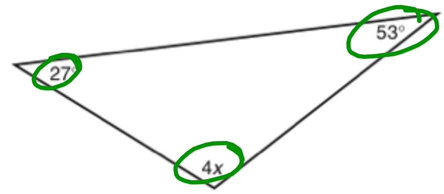


vertical ∠'s ≅

$$x + \cancel{29} + \cancel{127} = 180$$
$$\quad -\cancel{29} \quad -\cancel{127} \quad -29$$
$$-127$$

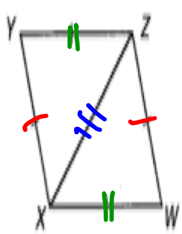
$$\boxed{x = 24^\circ}$$

26.



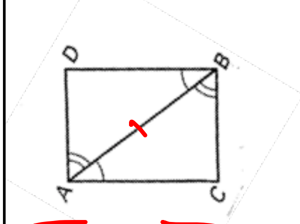
$$\cancel{27} + \cancel{53} + 4x = 180$$
$$-\cancel{27} \quad -\cancel{53} \qquad -27$$
$$-53$$
$$\frac{4x}{4} = \frac{100}{4}$$
$$\boxed{x = 25}$$

27. Prove that the two triangles are congruent. Use your method of choice.



Statement	Reason
$\overline{XY} \cong \overline{WZ}$	given
$\overline{YZ} \cong \overline{XW}$	given
$\overline{XZ} \cong \overline{XZ}$	reflexive
$\triangle XYZ \cong \triangle ZWX$	SSS

28. Which postulate or theorem can be used to prove that the triangles are congruent?



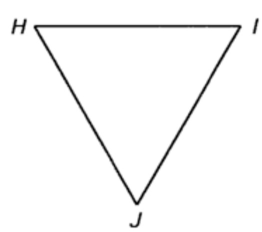
$\overline{AB} \cong \overline{AB}$
reflexive

ASA

29. Fill in the missing parts of the table to complete the two-column proof.

Given: $HI = 8, IJ = 8, \overline{IJ} \cong \overline{JH}$

Prove: $\overline{HI} \cong \overline{JH}$

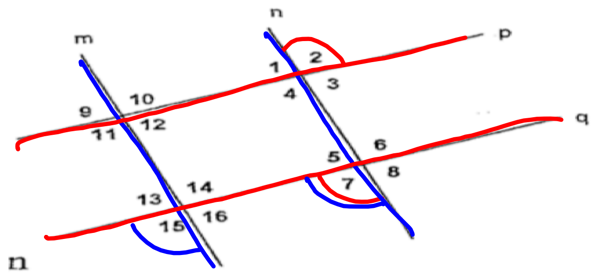


Statements	Reasons
1. $HI = 8$	1. Given
2. $IJ = 8$	2. Given
3. $HI = IJ$	3. Transitive/Substitution
4. $\overline{HI} \cong \overline{IJ}$	4. DOCS (definition of ≅ segments)
5. $\overline{IJ} \cong \overline{JH}$	5. Given
6. $\overline{HI} \cong \overline{JH}$	6. Transitive/Substitution

30. Complete the following proof using the method of your choice.

Given: $m \parallel n$ and $p \parallel q$

Prove: $\angle 2 \cong \angle 15$



m//n given

p//q given

<7 ≅ <15 corresponding <'s

<2 ≅ <7 AEA

<2 ≅ <15 transitive

or (substitution)