Geometry- Mrs. Tilus
Semester 1 Review

Name: _____

1. a) Find the coordinates of the midpoint of a segment connecting the points (-2, 9) and (8, 11).

midpoint formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) \Rightarrow \left(\frac{-2+8}{2}, \frac{9+11}{2}\right)$ (x_1, y_1 = (-2, 9); x_2, y_2 = (8, 11))

Midpoint: (3, 10)

b) Find the coordinates of the midpoint of a segment connecting the endpoints A(-4, 7) and B(-10, -1). (x_1, y_1 = (-4, 7); x_2, y_2 = (-10, -1))

$\Rightarrow \left(\frac{-4+(-10)}{2} + \frac{7+(-1)}{2}\right)$

Midpoint: (-7, 3)

c) Determine the distance from the point (10, 1) to the point (-3, 2). Round answers to two decimal places. (x_1, y_1 = (10, 1); x_2, y_2 = (-3, 2))

Distance Formula: $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$D = \sqrt{(-3-10)^2+(2-1)^2}$

$D = \sqrt{169+1}$

$D = \sqrt{170}$

Distance: $\sqrt{170} \approx 13.04$ units

d) Determine the distance from the point (8, 1) to the point (-3, 0). Round answers to two decimal places. (x_1, y_1 = (8, 1); x_2, y_2 = (-3, 0))

$D = \sqrt{(-3-8)^2+(0-1)^2}$

$D = \sqrt{121+1}$

$D = \sqrt{122}$

Distance: $\sqrt{122} \approx 11.05$ units

2. Identify the pattern, then find the next number in the pattern.

2a.) 1, 5, 9, 13, 17 (+4 +4 +4)

2a.) Pattern: Adding 4 to each term

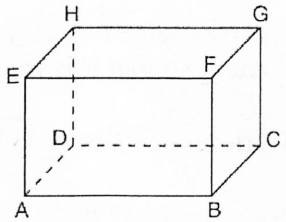
2b.) 1, 3, 6, 10, 15, 21 (+2 +3 +4 +5 +6)

2b.) Pattern: +2 +3 +4 increasing what you're adding by 1

2c.) $\frac{1}{1}, \frac{3}{2}, \frac{5}{3}, \frac{7}{4}, \frac{9}{5}$ ($\frac{7}{4}$: +2 to numerator, +1 to denominator)

2c.) Pattern: Adding 2 to each numerator and Adding 1 to each denominator

3. Use the diagram at the right to answer 3a-3d.



a) Name 2 points that are collinear: Many answers (Ex. Points E, A)

b) Name 3 points that are coplanar: Many answers (Ex. points A, B, F)

c) Name two lines that intersect at point D: $\overleftrightarrow{HD}$ and $\overleftrightarrow{AD}$, $\overleftrightarrow{HD}$ and $\overleftrightarrow{DC}$, $\overleftrightarrow{AD}$ and $\overleftrightarrow{DC}$

d) Name two planes that intersect at line EF: Plane EHF and Plane EFB

4. a) If two lines intersect, then their intersection is exactly @ one point.

b) If two planes intersect, then their intersection is a line.

5. a) The sum of the measures of two complimentary angles is 90°.

b) The sum of the measures of two supplementary angles is 180°.

c) Two angles that form a linear pair, their measures add up to 180°.

d) Vertical angles measures are Congruent to each other.

6. a) A polygon with all sides congruent is called equilateral.

b) A polygon with all interior angles congruent is called equiangular.

c) A polygon with all sides and angles congruent is called regular.

7. Give the number of sides for each polygon.

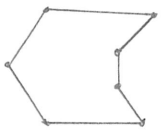
a) Octagon: 8 b) Quadrilateral: 4 c) Decagon: 10

d) Hexagon: 6 e) Triangle: 3 f) Nonagon: 9

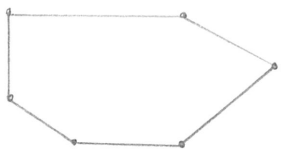
g) Pentagon: 5 h) Heptagon: 7

8. Draw an example of:

a) a concave polygon.



b) a convex polygon.



9. Area formula of a:

a) Triangle: A= $\frac{1}{2} \cdot b \cdot h$ OR $A = \frac{bh}{2}$ b) Rectangle: A= $l \cdot w$

c) Square: A= s^2 d) Circle: A= πr^2

10. a) Perimeter of a Rectangle: P= $l + w + l + w$ OR $P = 2l + 2w$ b) Circumference of a Circle: C= $2\pi r$

11. Properties (*Reflexive, Symmetric or Transitive*) are being shown in the following statements. Complete the statement so that it is true.

a) Reflexive: $\overline{RT} \cong$ $\overline{RT}$

b) Symmetric: If $m\angle ABC \cong m\angle RST$, then $m\angle RST \cong m\angle ABC$.

c) Transitive: If $m\angle 1 \cong m\angle 2$, and $m\angle 2 \cong m\angle 3$, then $m\angle 1 \cong m\angle 3$.

12. Is it possible to construct a triangle with these lengths? Show proof.

a) 23, 26, 40

$23 + 26 > 40$?

$49 > 40$ (true)

Yes

b) 42, 80, 35

$42 + 35 > 80$?

$77 > 80$ (False)

NO

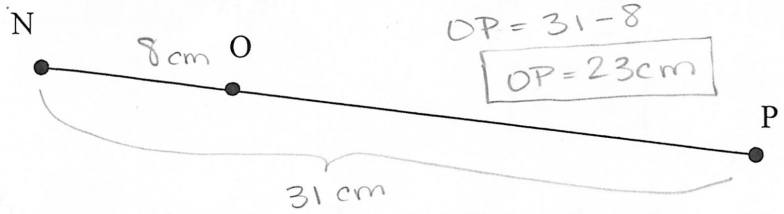
c) 52, 35, 87

$52 + 35 > 87$

$87 > 87$ (False)

No.

12. In the diagram below, if NO = 8 cm and NP = 31 cm, find OP.

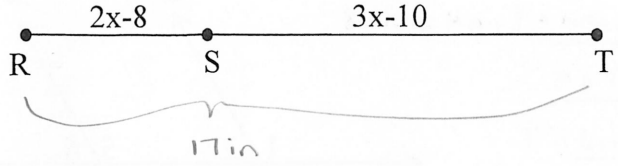


$OP = 31 - 8$

$OP = 23\text{cm}$

12.) OP = 23 cm

13. In the diagram below, RT = 17 in. Find RS and ST.



$2x - 8 + 3x - 10 = 17$

$5x - 18 = 17$

$+18 \quad +18$

$\frac{5x}{5} = \frac{35}{5}$

$x = 7$

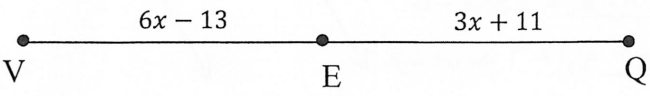
13.) RS = 6 in

ST = 11 in

$RS = 2(7) - 8 = 6$

$ST = 3(7) - 10 = 11$

14. Given point E is the midpoint of $\overline{VQ}$, determine EQ with the given information.



$6x - 13 = 3x + 11$

$-3x \quad -3x$

$3x - 13 = 11$

$+13 \quad +13$

$\frac{3x}{3} = \frac{24}{3}$

$x = 8$

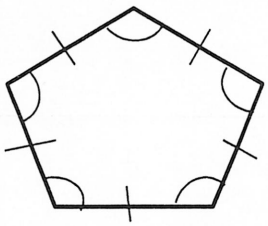
14.) EQ = 35 units

$EQ = 3(8) + 11$

$EQ = 35$

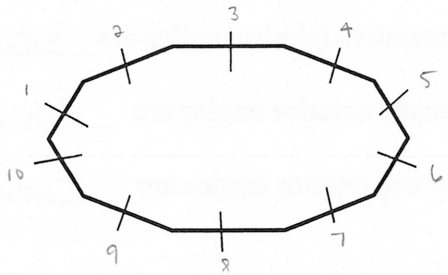
15. Classify each polygon by number of sides and determine whether it is equiangular, equilateral, or regular.

a)



Pentagon, Regular

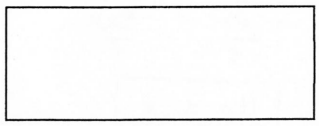
b)



Decagon, Equilateral

16 Use the information about the figure to find the indicated measures. LABEL your answers!

a) Rectangle:
Perimeter= 14 inches
Find x and area.



$P = 2w + 2l \Rightarrow 14 = 2(2) + 2x$

$14 = 4 + 2x$

$-4 \quad -4$

$\frac{10}{2} = \frac{2x}{2}$

$5 = x$

$A = l \cdot w$

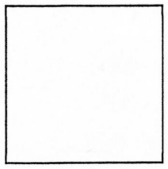
$A = (5)(2)$

$A = 10\ in^2$

16a.) x = 5 inches

Area = $10\ in^2$

b) Square:
Area= $56.25m^2$
Find x and the perimeter.



$A = s^2 \Rightarrow \sqrt{56.25} = \sqrt{s^2}$

$7.5 = s$

$P = 4(s)$

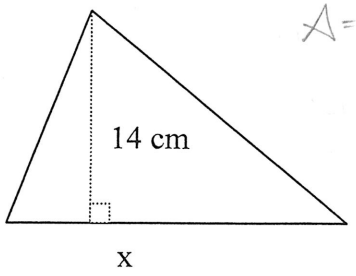
$P = 4(7.5)$

$P = 30\text{in}$

16b) x = 7.5 m

Perimeter = 30 in

c) Triangle:
Area= 56 cm^2
Find x.



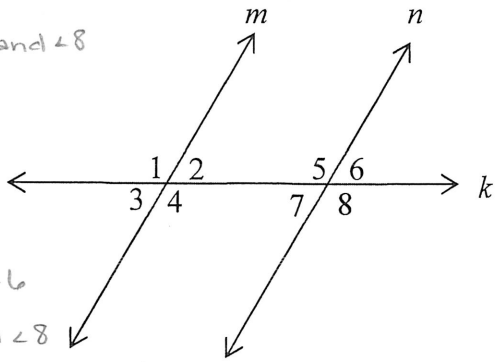
$A = \frac{1}{2}bh \Rightarrow 56 = \frac{1}{2}(x)(14)$

$\frac{56}{7} = \frac{7x}{7}$

$8 = x$

16c) $x =$ 8 cm

17. Use the diagram to identify an example of: *corresponding, alternate interior, alternate exterior, consecutive interior or vertical angles.*



a) Corresponding Angles: ∠1 and ∠5, ∠2 and ∠6, ∠3 and ∠7, ∠4 and ∠8

b) Alternate Interior Angles: ∠2 and ∠7, ∠4 and ∠5

c) Consecutive Interior Angles: ∠2 and ∠5, ∠4 and ∠7

d) Alternate Exterior Angles: ∠1 and ∠8, ∠3 and ∠6

e) Vertical Angles: ∠1 and ∠4, ∠2 and ∠3, ∠5 and ∠8, ∠7 and ∠6

f) Linear Pair: ∠1 and ∠2, ∠5 and ∠6, ∠3 and ∠4, ∠7 and ∠8

18. In the diagram above- If $m \parallel n$ and k is a transversal then…

a) Corresponding angles are Congruent

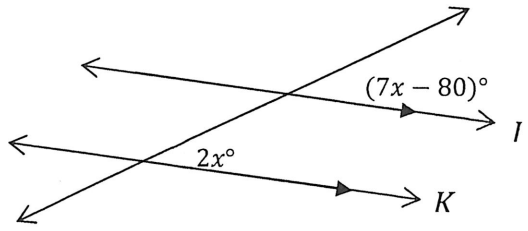
b) Consecutive interior angles are Supplementary

c) Alternate exterior angles are Congruent

d) Alternate interior angles are Congruent

19. Determine the value of x, if J||K.

a.)



$7x - 80 = 2x$

$-7x \quad -7x$

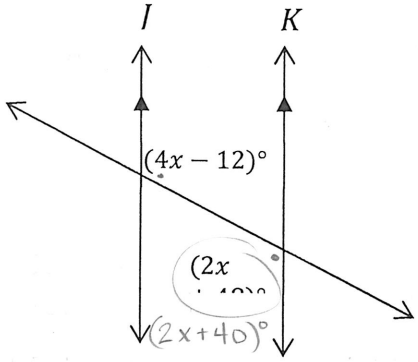
$-80 = -5x$

$\frac{-80}{-5} = \frac{-5x}{-5}$

$16 = x$

19a) $x =$ 16 units

b.)



$4x - 12 = 2x + 40$

$-2x \quad -2x$

$2x - 12 = 40$

$+12 \quad +12$

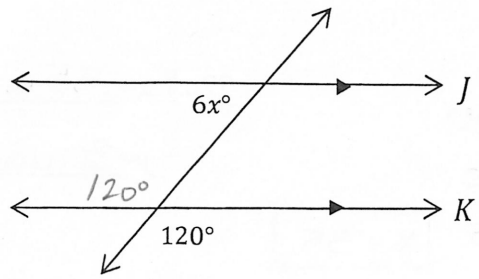
$2x = 52$

$\frac{2x}{2} = \frac{52}{2}$

$x = 26$

19b) $X =$ 26 units

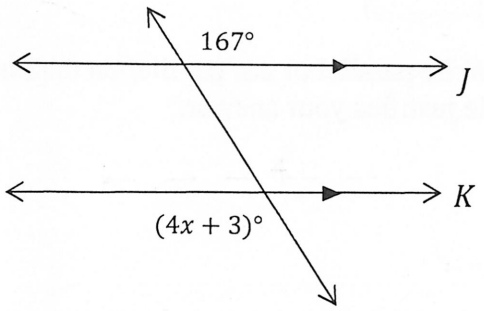
c.)



$6x + 120 = 180$
$-120 \quad -120$
$\frac{6x}{6} = \frac{60}{6}$
$x = 10$

19c.) $x = 10$ units

d.)



$4x + 3 = 167$
$-3 \quad -3$
$\frac{4x}{4} = \frac{164}{4}$
$x = 41$

19d.) $x = 41$ units

20. Use the following conditional statement to answer questions a-f.

If an angles measure is 90°, then it is a right angle.

a) What is the hypothesis? an angle measure is 90°.

b) What is the conclusion? it is a right angle.

c) Write the converse. If an angle is a right angle, then its measure is 90°

d) Write the inverse. If an angles measure is not 90°, then it is not a right angl.

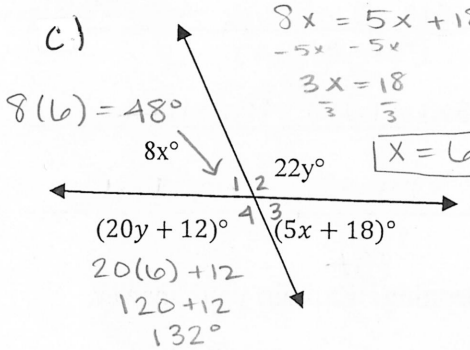
e) Write the contrapositive. If an angle is not a right angle, then its measure is not 90°

f) Write as a biconditional statement.

An angle measure is 90° iff it is a right angle.

21. Show your work! Find the value of the variables and the measure of each angle.

c)



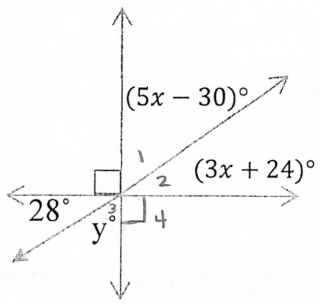
$8x = 5x + 18$ (Vertical ∠'s)
$-5x \quad -5x$
$\frac{3x}{3} = \frac{18}{3}$
$x = 6$

$8(6) = 48°$

$20(6) + 12$
$120 + 12$
$132°$

$22y = 20y + 12$
$-20y \quad -20y$
$\frac{2y}{2} = \frac{12}{2}$
$y = 6$

b.)



(Complementary ∠'s)

$5x - 30 + 3x + 24 = 90$
$8x - 6 = 90$
$\frac{8x}{8} = \frac{96}{8}$
$x = 12$

$28 + y = 90$
$y = 62$

21c.) $x =$ 6 units ∠1 and ∠3 = 48°

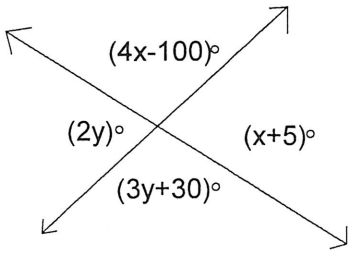
$y =$ 6 units ∠4 and ∠2 = 132°

.) $x =$ 12 units

$y =$ 62 units

$m\angle 1 = 5(12) - 30 = 30°$
$m\angle 2 = 3(12) + 24 = 60°$
$m\angle 3 = 62°$
$m\angle 4 = 90°$

c.) Find the measures of x and y. (Supplementary ∠'s)



$4x - 100 + x + 5 = 180$

$5x - 95 = 180$

$+95 \quad +95$

$\frac{5x}{5} = \frac{275}{5}$ $\boxed{x = 55}$

$2y + 3y + 30 = 180$

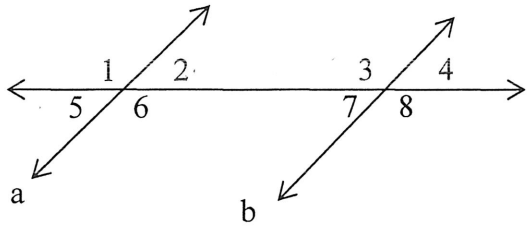
$5y + 30 = 180$

$\frac{5y}{5} = \frac{150}{5}$ $\boxed{y = 30}$

21a.) $x =$ 55 units

$y =$ 30 units

22. Use the diagram and information below to determine if $a \parallel b$. Write parallel or not parallel on the line provided. If the lines are parallel, write which **theorem or postulate** justifies your answer.



a.) Given: $\angle 5 \cong \angle 2$

23a.) Not Parallel

theorem or postulate - Not Enough Info

b.) Given: $\angle 2 + \angle 3 = 180°$

23b.) Parallel

theorem or postulate - Consecutive Int ∠'s Converse (Thm 3.6)

c.) Given: $< 5 \cong < 4$

23c.) Parallel

theorem or postulate - Alt. Exterior Angles Thm (Thm 3.5)

d.) Given: $< 2 \cong < 7$

23d.) Parallel

theorem or postulate - Alt. Interior Angles Converse (Thm 3.4)

e.) Given: $<2 + <6 = 180°$

23e.) Not Parallel

theorem or postulate - Not Enough Info

23. Is writing a proof an example of (circle one) **inductive** or **deductive** reasoning. Explain your answer.

Deductive reasoning uses facts, definitions, theorems, properties, etc. to form a logical argument.

Inductive uses patterns to predict an outcome

24. Decide whether the statement is true or false. If false, provide a counterexample.

a.) x^2 is always larger than x. False

If $x=0$, then $x^2=0^2=0$, $0 \not> 0$

OR

If $x=\frac{1}{2}$ then $x^2=(\frac{1}{2})^2=\frac{1}{4}$ $\frac{1}{2} \not> \frac{1}{4}$

b.) The product of two negative numbers is always positive.

True

25. Use the Law of Syllogism to write a new conditional statement based on the following:

If Ellie goes to college, then she will major in Chemistry. If Ellie majors in Chemistry, then she will need to buy a lab manual.

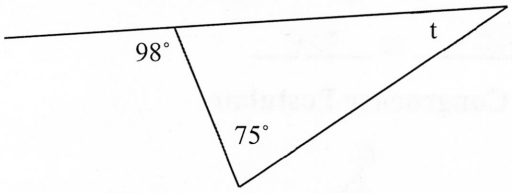
If Ellie goes to college then she will need to buy a lab manual.

26. In the following statement, what type of reasoning was used (circle one) **inductive** or **deductive**. Explain your reasoning.

For the past 5 years, your neighbor went on vacation for the 4th of July and they ask you to feed their dog. You conclude you will be asked to feed their dog the next 4th of July.

The conclusion is based off of past years experience (a pattern), not will solid evidence or facts.

27. Determine the measure of t.



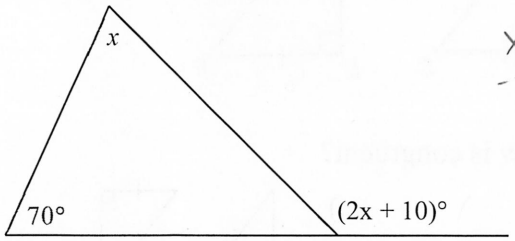
27.) $t =$ 23°

$t + 75° = 98°$

$-75 \quad -75$

$t = 23°$

28. Determine the value of x.



28.) $x =$ 60°

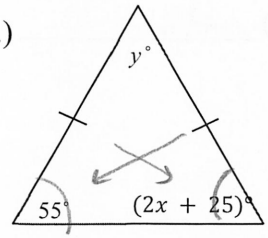
$x + 70 = 2x + 10$

$-x \quad -10 \quad -x \quad -10$

$60° = x$

29. Find x and y.

a.)



$55 = 2x + 25$

$-25 \quad -25$

$\frac{30}{2} = \frac{2x}{2}$

$x = 15$

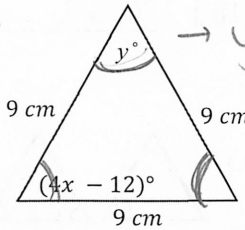
$55° + 55° + y = 180°$

$110° + y = 180°$

$-110 \quad -110$

$y = 70°$

b.)



$\rightarrow y = 60°$

$4x - 12 = 60$

$+12 \quad +12$

$\frac{4x}{4} = \frac{72}{4}$

$x = 18°$

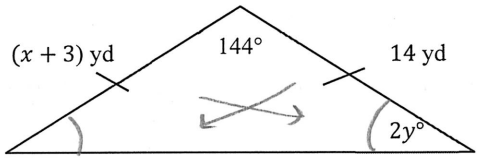
29a.) $x =$ 15°

$y =$ 70°

29b.) $x =$ 18°

$y =$ 60°

c.)



29c.) x= 11 yd

y= 9°

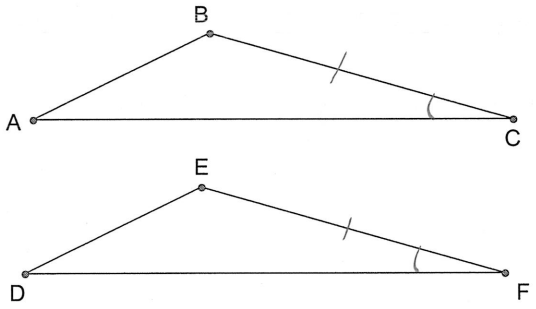
$x+3=14$
$-3 \quad -3$
$x=11$ yd

$2y+2y+144^\circ=180^\circ$
-144
$\frac{4y}{4}=\frac{36}{4}$
$y=9^\circ$

30. State the third congruence that must be given to prove that $\Delta ABC \cong \Delta DEF$ using the indicated postulate.

a.) $\overline{BC} \cong \overline{EF}$, $\angle C \cong \angle F$, Side $\overline{AC} \cong \overline{DF}$

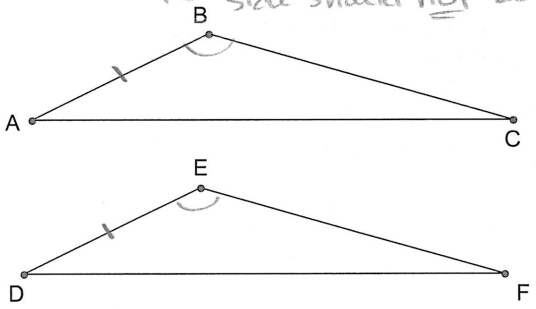
Use the SAS Congruence Theorem



b.) $\angle B \cong \angle E$, $\overline{AB} \cong \overline{DE}$, $\angle C \cong \angle F$

Use the AAS Congruence Postulate

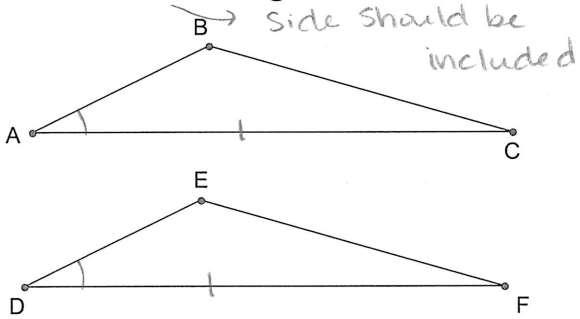
Side should not be included



c.) $\angle A \cong \angle D$, $\overline{AC} \cong \overline{DF}$, $\angle C \cong \angle F$

Use the ASA Congruence Postulate

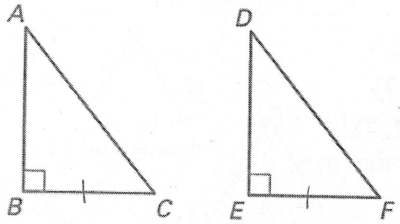
Side should be included



d.) $\triangle ABC$ and $\triangle DEF$ are right triangles,

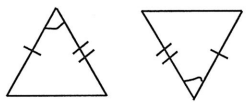
$\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$

Use the HL Congruence Postulate



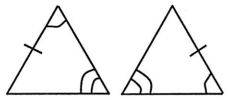
31. Which postulate or theorem proves that each pair of triangles below is congruent?

a.)



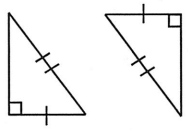
31a.) SAS

b.)



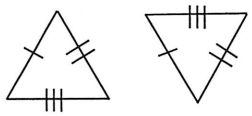
31b.) AAS

c.)



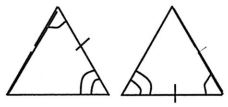
31c.) HL

d.)



31d.) SSS

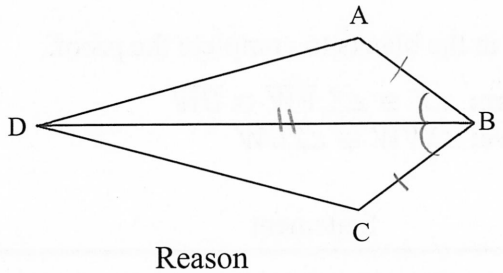
e.)



31e.) ASA

32. Fill in the blanks to complete the proof.

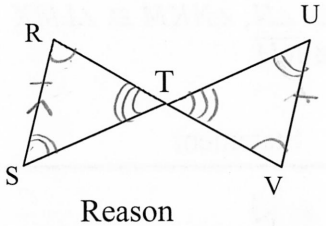
Given: $\overline{BD}$ bisects $\angle ABC$ and $\overline{AB} \cong \overline{CB}$
Prove: $\Delta ABD \cong \Delta CBD$



Statement	Reason
1. $\overline{BD}$ bisects $\angle ABC$	1. Given
2. $\angle ABD \cong \angle CBD$	2. Def^n of Angle Bisector
3. $\overline{AB} \cong \overline{CB}$	3. Given
4. $\overline{DB} \cong \overline{DB}$	4. Reflexive Property
5. $\Delta ABD \cong \Delta CBD$	5. SAS

33. Fill in the blanks to complete the proof.

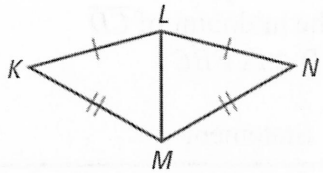
Given: $\overline{RS} \parallel \overline{UV}$ and $\overline{RS} \cong \overline{UV}$
Prove: $\overline{RT} \cong \overline{VT}$



Statement	Reason
1. $\overline{RS} \parallel \overline{UV}$	1. Given
2. $\angle R \cong \angle V$	2. Alternate Interior Angles
3. $\angle S \cong \angle U$ (OR $\angle RTS \cong \angle VTU$)	3. Alt. Interior Angles (Vertical Angles)
4. $\overline{RS} \cong \overline{VU}$	4. Given
5. $\Delta RTS \cong \Delta VTU$	5. ASA (AAS)
6. $\overline{RT} \cong \overline{VT}$	6. CPCTC

34. Fill in the blanks to complete the proof.

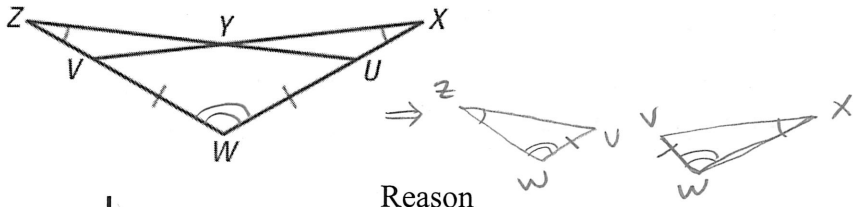
Given: $\overline{KL} \cong \overline{NL}$, $\overline{KM} \cong \overline{NM}$
Prove: $\Delta KLM \cong \Delta NLM$



Statement	Reason
1. $\overline{KL} \cong \overline{NL}$	1. Given
2. $\overline{KM} \cong \overline{NM}$	2. Given
3. $\overline{LM} \cong \overline{LM}$	3. Reflexive Property
4. $\Delta KLM \cong \Delta NLM$	4. SSS

35. Fill in the blanks to complete the proof.

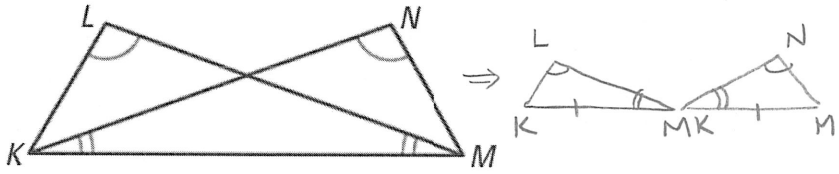
Given: $\angle X \cong \angle Z, \overline{VW} \cong \overline{UW}$
Prove: $\angle XVW \cong \angle ZUW$



Statement	Reason
1. $\angle X \cong \angle Z$	1. Given
2. $\overline{VW} \cong \overline{UW}$	2. Given
3. $\angle W \cong \angle W$	3. Reflexive Property
4. $\triangle XVW \cong \triangle ZUW$	4. AAS
5. $\angle XVW \cong \angle ZUW$	5. CPCTC

36. Fill in the blanks to complete the proof.

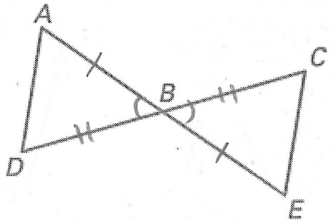
Given: $\angle L \cong \angle N, \angle NKM \cong \angle LMK$
Prove: $\overline{LK} \cong \overline{NM}$



Statement	Reason
1. $\angle L \cong \angle N$	1. Given
2. $\angle NKM \cong \angle LMK$	2. Given
3. $\overline{KM} \cong \overline{MK}$	3. Reflexive Property
4. $\triangle LMK \cong \triangle NKM$	4. AAS
5. $\overline{LK} \cong \overline{NM}$	5. CPCTC

37. Fill in the blanks to complete the proof.

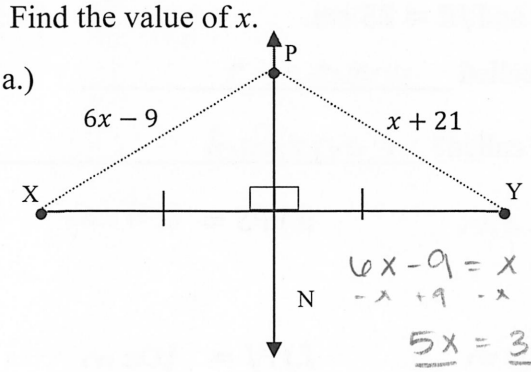
Given: B is the midpoint of $\overline{AE}$
B is the midpoint of $\overline{CD}$
Prove: $\triangle ABD \cong \triangle EBC$



Statement	Reason
1. B is the midpoint of $\overline{AE}$	1. Given
2. $\overline{AB} \cong \overline{EB}$	2. Def^n of a midpoint
3. B is the midpoint of $\overline{CD}$	2. Given
4. $\overline{DB} \cong \overline{CB}$	4. Def^n of a midpoint
5. $\angle ABD \cong \angle EBC$	5. Vertical Angles
6. $\triangle ABD \cong \triangle EBC$	6. SAS

38. Find the value of x.

a.)



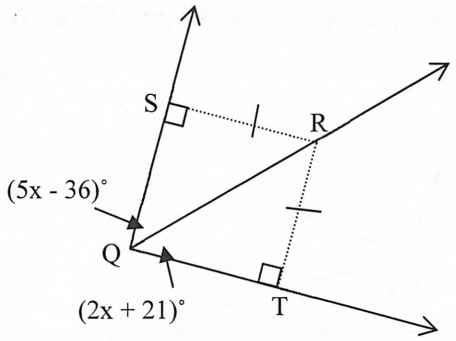
$6x - 9 = x + 21$
$-x \quad +9 \quad -x \quad +9$

$\frac{5x}{5} = \frac{30}{5}$

$x = 6$

38a.) $x = 6$ units
(⊥ bisector thm)

b.)



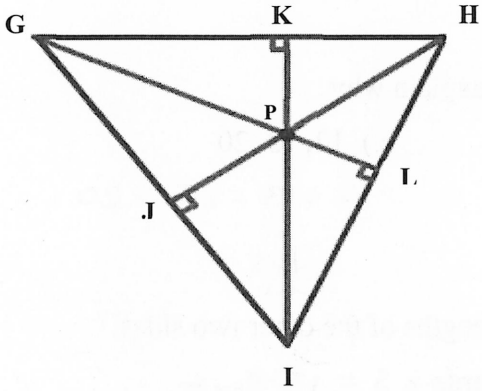
$5x - 36 = 2x + 21$
$-2x \quad +36 \quad -2x \quad +36$

$\frac{3x}{3} = \frac{57}{3}$

$x = 19$

38b.) $x = 19$ units
(Angle bisector thm)

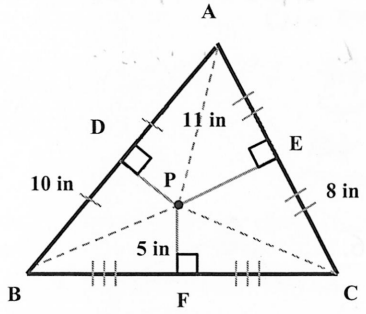
39. Use the figure below to answer the questions.



a.) $\overline{GL}$, $\overline{HJ}$, $\overline{IK}$, are called Altitudes

b.) What is point P called? Ortho center

40. Use the figure below to answer the questions.



a.) $\overline{DP}$, $\overline{EP}$, $\overline{FP}$ are called ⊥ Bisectors

b.) What is point P called? Circumcenter

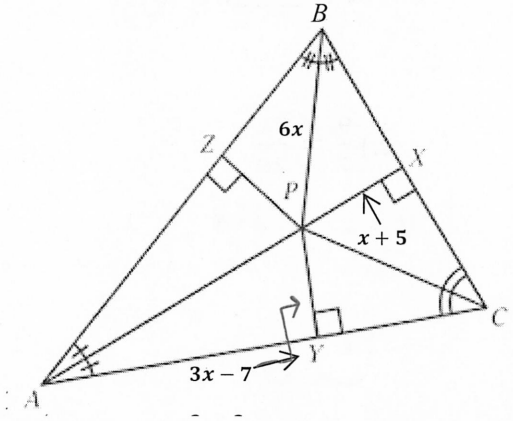
c.) $CP = 11in$

d.) $AD = 10in$

e.) $AC = 16$ in

f.). $BP = 11in$

41. Use the figure below to answer the questions.



a.) $\overline{AP}$, $\overline{BP}$, $\overline{CP}$, are called Angle Bisectors

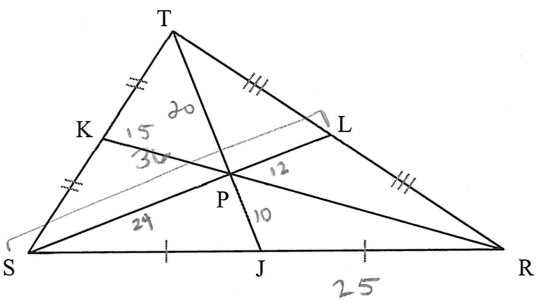
b.) What is point P called? Incenter

c.) Find the value of x. $3x - 7 = x + 5$
$-x \quad +7 \quad -x \quad +7$

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$ units

42. In the diagram below, $LS = 36\ cm$, $TP = 20\ cm$, $KP = 15\ cm$ and $JR = 25\ cm$.



a.) $\overline{SL}, \overline{TJ}, \overline{RK}$ are called medians

b.) What is Point P called? centroid

c.) $PL =$ 12cm

d.) $PS =$ 24cm

e.) $TJ =$ 30cm

f.) $PJ =$ 10cm

g.) $JS =$ 25cm

h.) $RS =$ 50cm

i.) $PR =$ 30cm

j.) $KR =$ 45cm

43. Is it possible to construct a triangle with the given side lengths? If not, explain why.

a.) 12, 14, 25

$12 + 14 = 26 > 25$

yes

b.) 4, 9, 13

$4 + 9 = 13 \not> 13$

NO.

c.) 12, 13, 20

$12 + 13 = 25 > 20$

yes

44. Describe the possible lengths of the third side of the triangle given the lengths of the other two sides.

a.) 16 inches, 23 inches

$23 - 16 = 7$ $\quad 23 + 16 = 39$

$7in < X < 39in$

b.) 18 feet, 5 yards (6 yards) $\times 3 = 15$ feet

$18 - 15 = 3$ $\quad (6 - 5 = 1)$

$18 + 15 = 33$ $\quad (6 + 5 = 11)$

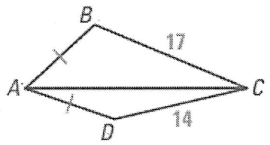
$3ft < X < 33ft$

OR

$1yd < X < 11yd$

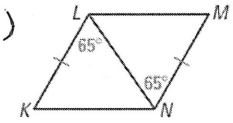
45. Complete with $<, >$ *or* $=$. Justify your answer.

a.)



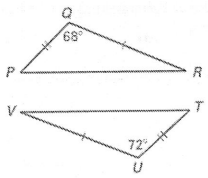
$m\angle BAC$ > $m\angle DAC$

b.)



LM = KN

c.)



PR < VT

46. Solve the proportions.

a.) $\frac{3}{7} = \frac{t}{20}$

$\frac{60}{7} = \frac{7t}{7}$

$t = 8.57$

b.) $\frac{2}{5} = \frac{m-6}{14}$

$28 = 5(m-6)$

$28 = 5m - 30$

$+30 \quad +30$

$\frac{58}{5} = \frac{5m}{5}$

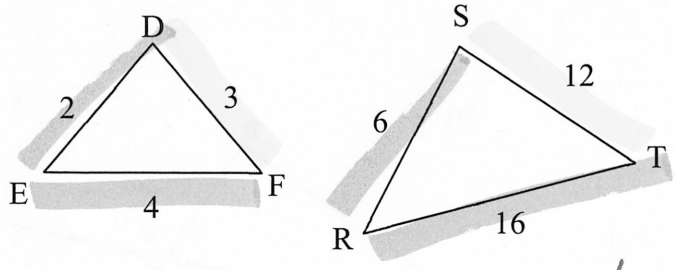
$m = 11.6$

c.) $\frac{9}{7} = \frac{3x}{28}$

$\frac{252}{21} = \frac{21x}{21}$

$12 = x$

b.)



$\frac{4}{16} = \frac{1}{4}$ $\frac{2}{6} = \frac{1}{3}$

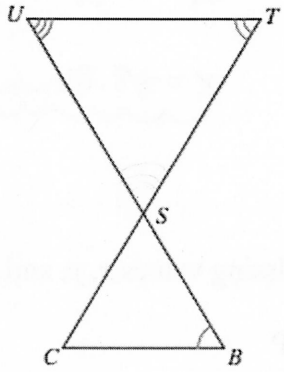
$\frac{3}{12} = \frac{1}{4}$

(not similar; not all corresponding sides proportional)

If **YES**: Similarity statement: _____

Theorem: _____

c.)



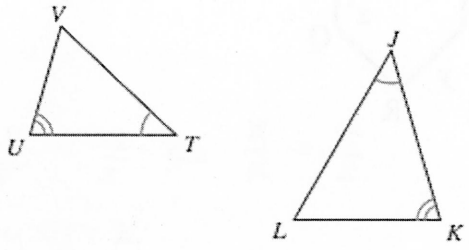
$\angle S \cong \angle S$

(not similar; not enough info for $\triangle\triangle$)

If **YES**: Similarity statement: _____

Theorem: _____

d.)

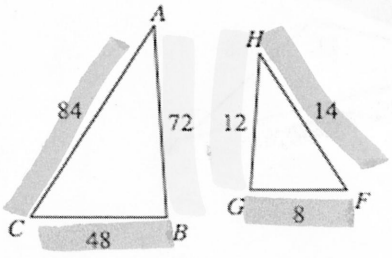


$\angle U \cong \angle K$, $\angle T \cong \angle J$

If **YES**: Similarity statement: $\triangle TUV \sim \triangle JKL$

Theorem: $\triangle\triangle$

e.)



$\frac{84}{14} = \frac{6}{1}$ $\frac{48}{8} = \frac{6}{1}$

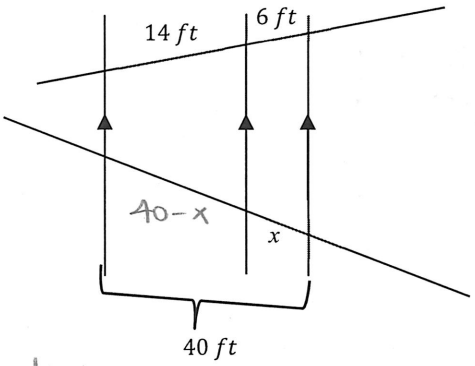
$\frac{72}{12} = \frac{6}{1}$

If **YES**: Similarity statement: $\triangle ABC \sim \triangle HGF$

Theorem: SSS

47. Find the value of x.

a)



$\frac{14}{40-x} = \frac{6}{x} \Rightarrow 14x = 6(40-x)$

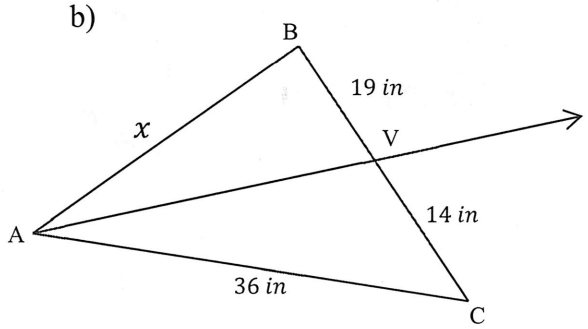
$14x = 240 - 6x$

$+6x \quad +6x$

$\frac{20x}{20} = \frac{240}{20}$

$x = 12$ units

b)



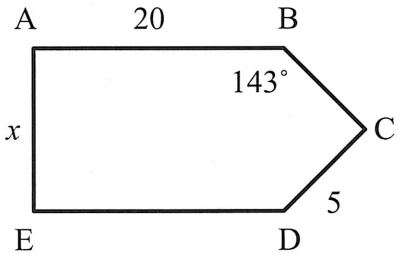
$\frac{19}{14} = \frac{x}{36} \Rightarrow \frac{684}{14} = \frac{14x}{14}$

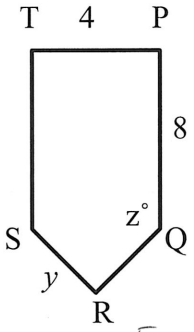
$x = 48.86$ units

48. If ABCDE ~ PQRST, find the scale factor of ABCDE to PQRST and the missing values x, y, and z.

top bottom

Specific order





Scale factor: $\frac{20}{8} = \frac{5}{2}$

$\frac{5}{2} = \frac{5}{y} \Rightarrow \frac{5y}{5} = \frac{10}{5}$

$y = 2$ units

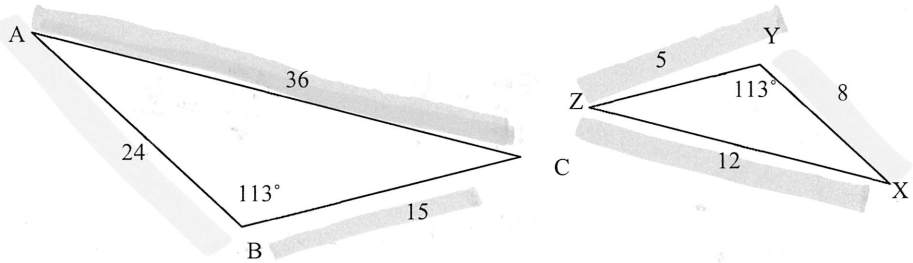
$\frac{5}{2} = \frac{x}{4} \Rightarrow \frac{20}{2} = \frac{2x}{2}$

$x = 10$ units

$z = 143°$

49. Determine if the two triangles are similar. If yes, write a similarity statement and the theorem that proves they are similar. If no, say not similar. **Show proof.**

a.)



$\frac{24}{8} = \frac{3}{1}$

$\frac{36}{12} = \frac{3}{1}$

$\frac{15}{5} = \frac{3}{1}$

If **YES**: Similarity statement: $\triangle ABC \sim \triangle XYZ$ Theorem: SSS OR SAS

(Scale Factor: 3 to 1 OR 1 to 3)