

For 1 and 2, rewrite the statement as an if-then statement. Then write the converse, inverse and contrapositive.

1. All students with a 90% average are on high honor roll.

If-Then: If a student has a 90% average, then they are on the high honor roll.

Converse: If a student is on the high honor roll, then they have a 90% average.

Inverse: If a student does not have a 90% average, then they are not on the high honor roll.

2. When two planes intersect, their intersection is a line.

If-Then: If two planes intersect, then their intersection is a line.

Converse: If two figures' intersection is a line, then the figures are planes.

Inverse: If two planes do not intersect, then their intersection is not a line.

- For 3 through 10:      1) Make a conclusion using statements 1 and 2 below.  
                                  2) State the law you used (Law of Detachment & Law of Syllogism – YOU MUST KNOW THESE)

**\*\*If no conclusion can be made- state no conclusion.\*\***

3. (1) If a triangle has a right angle, then it is a right triangle.

(2) In  $\triangle ABC$ ,  $\angle A = 90^\circ$ .      Law of Detachment

$\triangle ABC$  is a right triangle

4. (1) If  $a = 5$ , then  $b = 6$ .

(2) If  $b = 6$ , then  $c = 7$ .      Law of Syllogism

If  $a = 5$ , then  $c = 7$

5. (1) If a figure is a parallelogram, then opposite sides are equal.

(2) If a figure is a rhombus, then it is a parallelogram.

Law of Syllogism

If a figure is a rhombus, then opposite sides are equal

6. (1) If the pet is a dog, then it has a tail.  
 (2) DJ's pet has a tail.

No conclusion

7. (1) If Jessica gets higher than a 95%, then she gets an A.  
 (2) Jessica got an A.

No conclusion

8. (1) If Sara passes the chapter 8 test, then she will pass the semester.  
 (2) If Sara passes the chapter 8 test, then she will have a C+ in the class.

No conclusion

9. (1) If you go to computer camp, you will get a computer.  
 (2) If you make an A in geometry, you can go to computer camp.

Law of Syllogism

If you make an A in geometry, then you will get a computer.

10. (1) If the animal is a dog, then the dog likes bones.

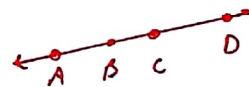
- (2) Uma is a dog. Law of Detachment

Uma likes bones

For 11-14, answer the following related to points, lines, and planes.

11. Define the word collinear – then draw an example.

Points are collinear if they lie on the same line



12. Define the word coplanar – then draw an example.

Points that are coplanar exist in the same plane



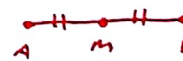
13. Define the word perpendicular – then draw an example (include NOTATION!!!)

Lines or planes are perpendicular if they intersect to form a right angle



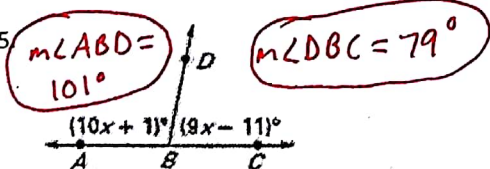
14. Define the word midpoint – then draw an example (include NOTATION!!!)

A midpoint is a point that divides a segment into two congruent segments



For 15 – 18, use your knowledge of linear pairs, vertical angles, supplementary angles, and complementary angles to find the MEASURE OF EACH ANGLE in the following diagrams.

15.



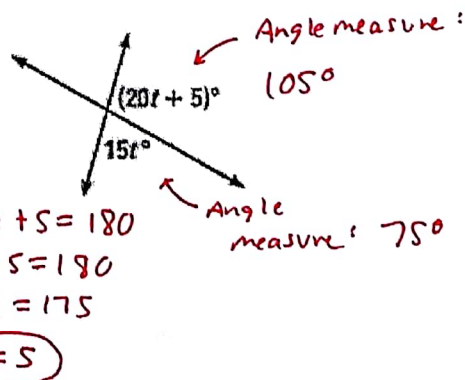
$$10x + 7 + 9x - 11 = 180$$

$$19x - 10 = 180$$

$$19x = 190$$

$$x = 10$$

16.



$$15t + 20t + 5 = 180$$

$$35t + 5 = 180$$

$$35t = 175$$

$$t = 5$$

17.  $7x-2 = 11x-34$   $18y = 126$   
 $32 = 4x$   $y = 7$   
 $8 = x$

18. Given:  $m\angle A = (4x-2)^\circ$  and  $m\angle B = (11x+17)^\circ$

a. Find the measure of each angle if the two angles are COMPLEMENTARY

$$4x-2 + 11x+17 = 90$$

$$15x + 15 = 90$$

$$15x = 75$$

$$x = 5$$

$m\angle A = 18^\circ$   
 $m\angle B = 72^\circ$

b. Find the measure of each angle if the two angles are SUPPLEMENTARY

$$4x-2 + 11x+17 = 180$$

$$15x + 15 = 180$$

$$15x = 165$$

$$x = 11$$

$m\angle A = 42^\circ$   
 $m\angle B = 138^\circ$

In 19 through 21, solve the equations. Write a REASON for each step.

19.  $10x - 6 = 74$

Step	Reason
1.) $10x - 6 = 74$	1.) Given
2.) $10x = 80$	2.) Addition P.O. =
3.) $x = 8$	3.) Division P.O. =

20.  $4(x-5) = 140$

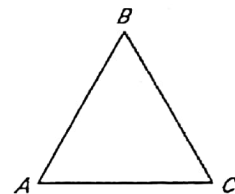
Step	Reason
1.) $4(x-5) = 140$	1.) Given
2.) $4x-20 = 140$	2.) Distributive Prop.
3.) $4x = 160$	3.) Addition P.O. =
4.) $x = 40$	4.) Division P.O. =

21.  $3(2x-7) + 5 = -10$

Step	Reason
1.) $3(2x-7) + 5 = -10$	1.) Given
2.) $3(2x-7) = -15$	2.) Subtraction P.O. =
3.) $2x-7 = -5$	3.) Division P.O. =
4.) $2x = 2$	4.) Addition P.O. =
5.) $x = 1$	5.) Division P.O. =

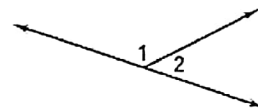
For 22 – 26, write a proof about the segments and angles using the GIVEN statements, vocabulary, and diagram to help you. IF you are stuck – write down EVERYTHING you know, and then start to think about how you can combine these pieces of information to prove the statement.

22. GIVEN:  $m\angle A = m\angle B$ ,  $m\angle B = m\angle C$   
 PROVE:  $\angle A \cong \angle C$



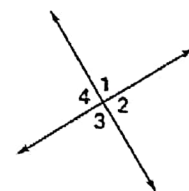
Statements	Reasons
1.) $m\angle A = m\angle B$ , $m\angle B = m\angle C$	1.) Given
2.) $m\angle A = m\angle C$	2.) Substitution P.O. = / Transitive P.O. =
3.) $\angle A \cong \angle C$	3.) Defn. of $\cong$ Angles

23. GIVEN:  $\overline{DE} = \overline{EF}$ ,  $\overline{EF} = \overline{DF}$   
 PROVE:  $\overline{DF} \cong \overline{DE}$



Statements	Reasons
1.) $\overline{DE} = \overline{EF}$ , $\overline{EF} = \overline{DF}$	1.) Given
2.) $\overline{DE} = \overline{DF}$	2.) Substitution P.O. = / Transitive P.O. =
3.) $\overline{DE} \cong \overline{DF}$	3.) Defn. of $\cong$ segments
4.) $\overline{DF} \cong \overline{DE}$	4.) Symmetric P.O. $\cong$

24. GIVEN:  $\angle 3 \cong \angle 2$   
 PROVE:  $m\angle 1 = m\angle 4$



Statements	Reasons
1.) $\angle 3 \cong \angle 2$	1.) Given
2.) $\angle 1 \cong \angle 3$ , $\angle 2 \cong \angle 4$	2.) VA $\cong$ Thm.
3.) $\angle 1 \cong \angle 4$	3.) Transitive P.O. $\cong$
4.) $m\angle 1 = m\angle 4$	4.) Defn. of $\cong$ Angles