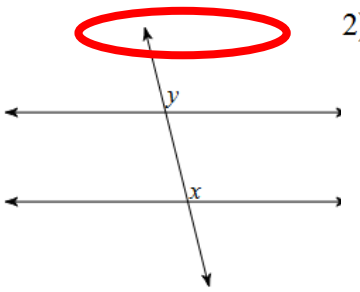
Unit 4 Lesson 2: Introduction to geometric proofs

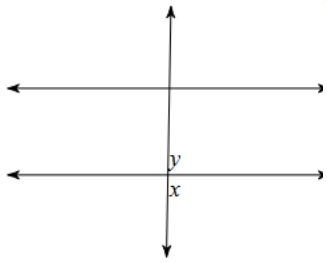
Identify each pair of angles are corresponding, alternate interior, alternate exterior, consecutive interior, consecutive exterior, vertical, or a linear pair. Decide whether they are congruent or supplementary.

1) CORRESPONDING



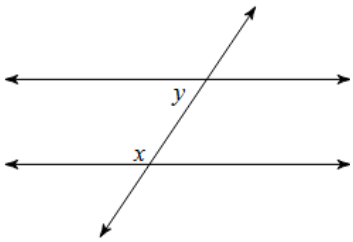
Congruent or Supplementary

2) LINEAR PAIR



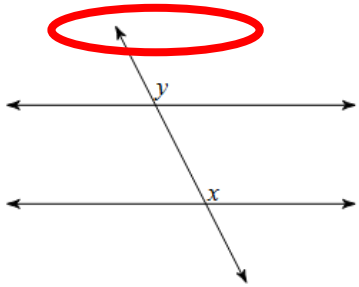
Congruent or **Supplementary**

3) CONSECUTIVE INTERIOR



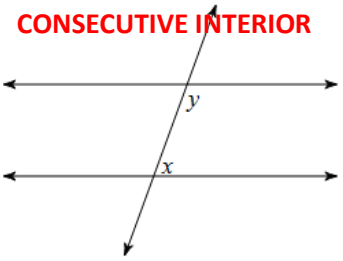
Congruent or **Supplementary**

4) CORRESPONDING



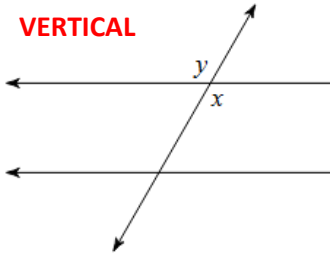
Congruent or Supplementary

5) CONSECUTIVE INTERIOR



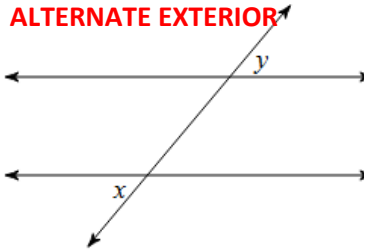
Congruent or **Supplementary**

6) VERTICAL



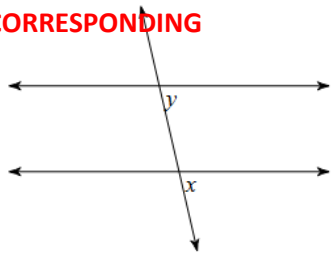
Congruent or Supplementary

7) ALTERNATE EXTERIOR



Congruent or Supplementary

8) CORRESPONDING



Congruent or Supplementary

Using the figure below, state the transversal that forms each pair of angles. Then identify the special name for the angle pair.

9) ∠1 *and* ∠12 transversal: **R** special name: **CONSECUTIVE EXTERIOR**

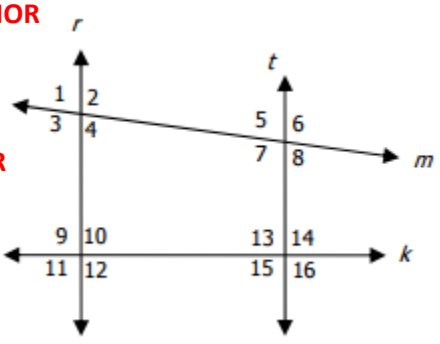
10) ∠2 *and* ∠10 transversal: **R** special name: **CORRESPONDING**

11) ∠4 *and* ∠9 transversal: **R** special name: **ALTERNATE INTERIOR**

12) ∠6 *and* ∠3 transversal: **M** special name: **ATERNATE EXTERIOR**

13) ∠14 *and* ∠10 transversal: **K** special name: **CORRESPONDING**

14) ∠7 *and* ∠13 transversal: **T** special name: **CONSECUTIVE INTERIOR**



In the figure below $a \parallel b, m\angle 1 = 78°$, and $m\angle 2 = 47°$. Find the measure of each angle.

15) ∠3: 102°

16) ∠4: 102°

17) ∠5: 78°

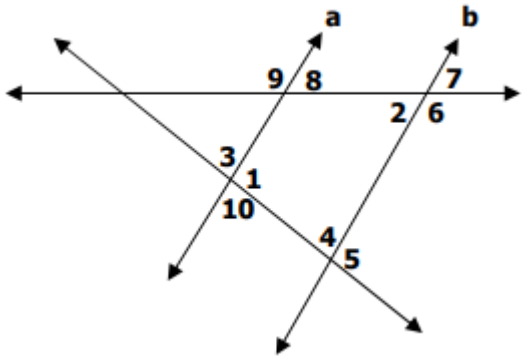
18) ∠6: 133°

19) ∠7: 47°

20) ∠8: 47°

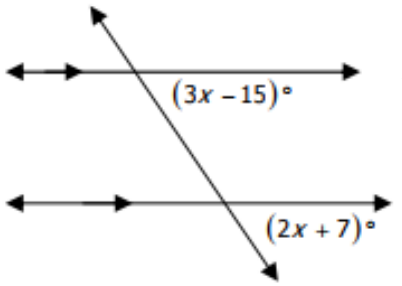
21) ∠9: 133°

22) ∠10: 102°



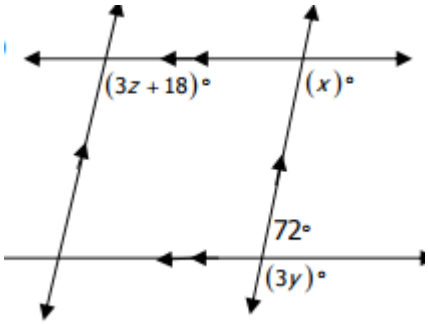
Find the missing value of x, y and z.

23.



x= 22

24.

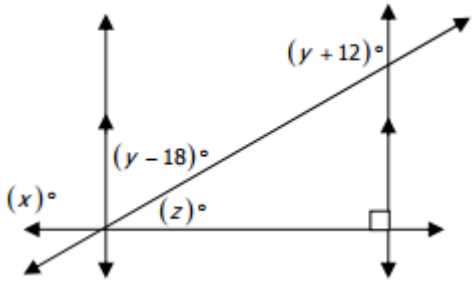


x= 108

y= 36

z= 30

25.

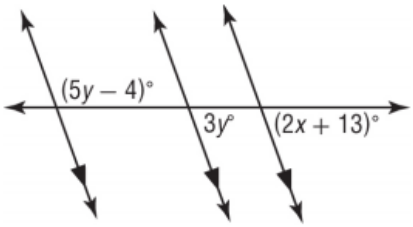


x= 90

y= 93

z= 15

26.

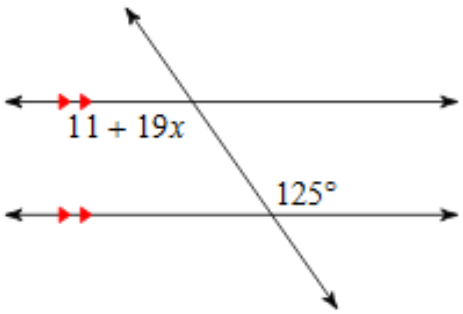


x= 26.5

y= 22

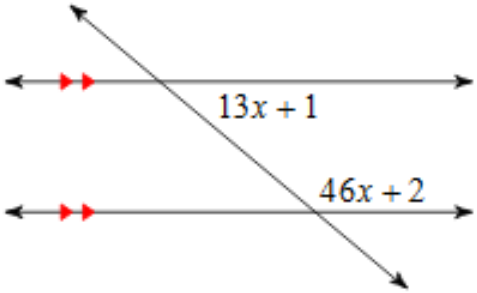
Property	Example
Addition Property of Equality	
Subtraction Property of Equality	
Multiplication Property of Equality	
Division Property of Equality	
Transitive Property	
Reflexive Property	
Substitution	

27) Given the diagram below, prove that $x = 6$ by justifying each step.



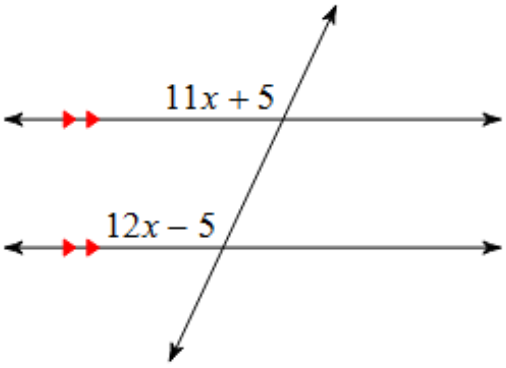
Statement	Reason
$11 + 19x = 125$	ALTERNATE INTERIOR
11-11+19X=125-11	SUBTRACTION PROPERTY
$19x = 114$	SUBSTITUTION PROPERTY
9X/9=114/9	DIVISION PROPERTY
$x = 6$	SUBSTITUTION PROPERTY

28) Given the diagram below, prove that $x = 3$ by justifying each step.



Statement	Reason
$13x + 1 + 46x + 2 = 180$	CONSECUTIVE INTERIOR
13X+46X+1+2=180	SUBSTITUTION PROPERTY
$59x + 3 = 180$	SUBSTITUTION PROPERTY
59X+3-3=180-3	SUBTRACTION PROPERTY
$59x = 177$	SUBSTITUTION PROPERTY
59X/59=177/59	DIVISION PROPERTY
$x = 3$	SUBSTITUTION PROPERTY

29) Given the diagram below, prove that $x = 10$.



Statement	Reason
$11x + 5 = 12x - 5$	CORRESPONDING
11X-11X+5=12X-11X-5	SUBTRACTION PROPERTY
$5 = x - 5$	SUBSTITUTION PROPERTY
5+5=X-5+5	ADDITION PROPERTY
$10 = x$	SUBSTITUTION PROPERTY
$x = 10$	TRANSITIVE PROPERTY

For each diagram below:

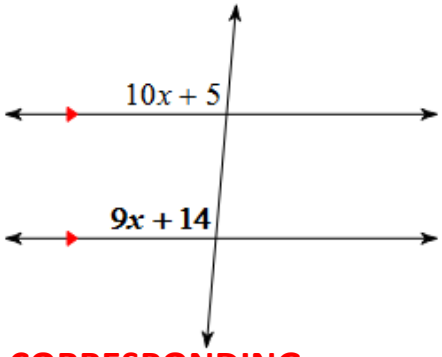
a) Identify the relationship between the angles

b) State whether the angles are congruent or supplementary

c) Find the value of x that makes the lines parallel

d) Find the value of the bolded angle.

1)



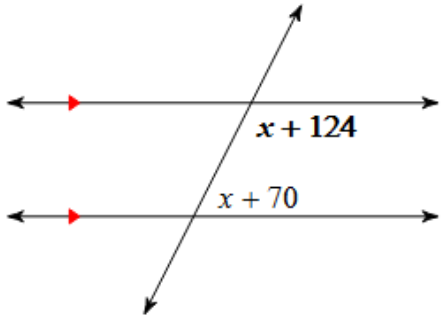
a) CORRESPONDING

b) CONGRUENT

c) X=9

d) 95°

2)



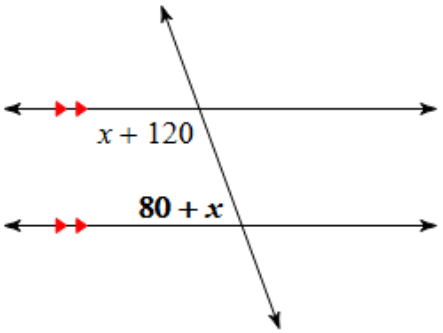
a) CONSECUTIVE INTERIOR

b) SUPPLEMENTARY

c) X=-7

d) 117°

3)



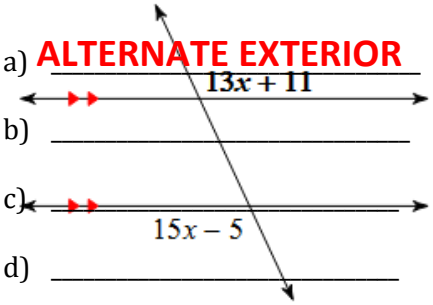
a) CONSECUTIVE INTERIOR

b) SUPPLEMENTARY

c) X=-10

d) 70°

4)



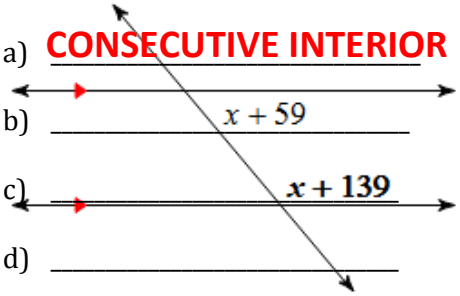
a) ALTERNATE EXTERIOR

b)

c)

d)

5)



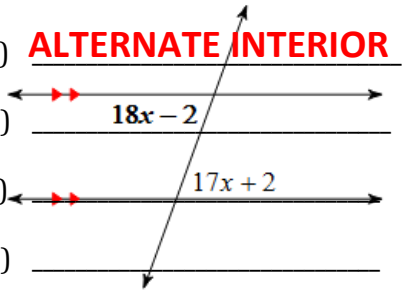
a) CONSECUTIVE INTERIOR

b)

c)

d)

6)



a) ALTERNATE INTERIOR

b)

c)

d)

CONGRUENT

X=8

115°

SUPPLEMENTARY

X=-9

130°

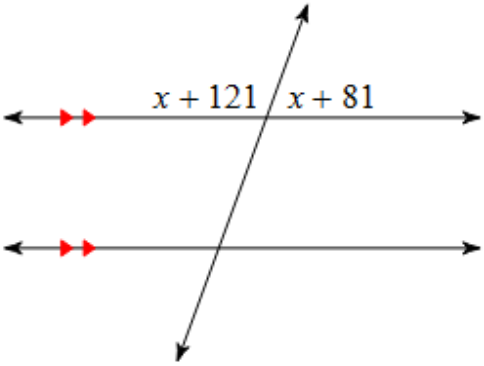
CONGRUENT

X=4

70°

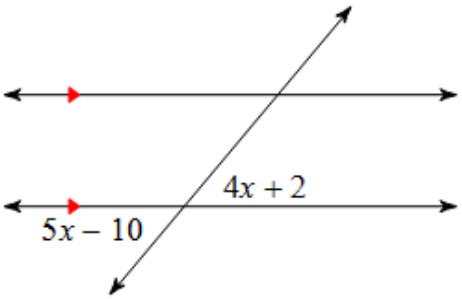
7. Given the diagram below, prove that $x = -11$.

Statement	Reason



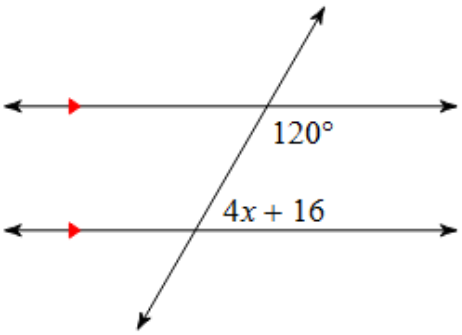
1. $x + 121 + x + 81 = 180$	LINEAR PAIR
2. x+x+121+81=180	SUBSTITUTION PROPERTY
3. $2x + 202 = 180$	SUBSTITUTION PROPERTY
4. 2x+202-202=180-202	SUBTRACTION PROPERTY
5. $2x = -22$	SUBSTITUTION PROPERTY
6. 2x/2=-22/2	DIVISION PROPERTY
7. $x = -11$	SUBSTITUTION PROPERTY

8. Given the diagram below, prove that $x = 12$.



Statement	Reason
1. $5x - 10 = 4x + 2$	VERTICAL
2. 5x-4x-10=4x-4x+2	SUBTRACTION PROPERTY
3. $x - 10 = 2$	SUBSTITUTION PROPERTY
4. x-10+10=2+10	ADDITION PROPERTY
5. $x = 12$	SUBSTITUTION PROPERTY

9. Given the diagram below, prove that $x = 11$.



Statement	Reason
1. $4x + 16 + 120 = 180$	CONSECUTIVE INTERIOR
2. $4x + 136 = 180$	SUBSTITUTION PROPERTY
3. 4x+136-136=180-136	SUBTRACTION PROPERTY
4. $4x = 44$	SUBSTITUTION PROPERTY
5. 4x/4=44/4	DIVISION PROPERTY
6. $x = 11$	SUBSTITUTION PROPERTY