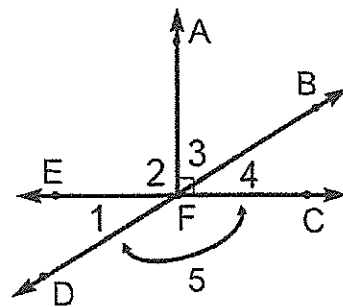


Use the word bank below to answer questions 1 and 2.

- Complementary
- Bisector
- Corresponding angles
- Alternate exterior angles
- Supplementary
- Adjacent angle
- Alternate interior angles
- Same side interior angles
- Linear Pair
- Vertical angle

1. Use the diagram on the right and the word bank to answer the following questions.

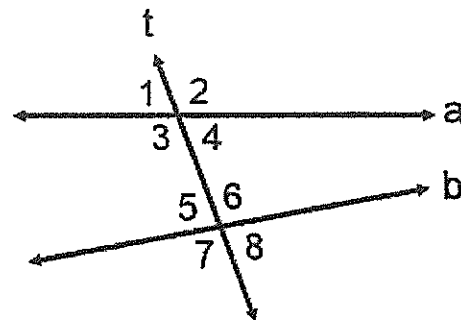
- A) Angles 1 and 4 form vertical angles.
- B) Angles 1 and 2 are adjacent.
- C) Angles 1 and 5 are supplementary or linear pair.
- D) If $\angle 3 \cong \angle 4$, then \overline{FB} is a bisector.
- E) Angles 3 and 4 form a right angle, so they are complementary.



2. Use the diagram on the right and the word bank to answer the following questions.

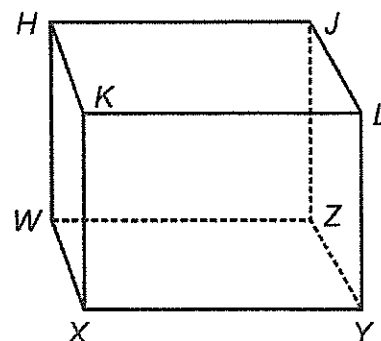
What type of angle relationship is demonstrated by each pair of angles?

- A) $\angle 2$ and $\angle 7$ alternate exterior \angle s
- B) $\angle 3$ and $\angle 6$ alternate interior \angle s
- C) $\angle 3$ and $\angle 7$ corresponding \angle s
- D) If $a \parallel b$, will $\angle 4$ and $\angle 6$ be congruent or supplementary? (circle one)

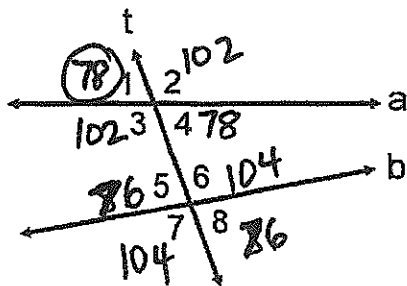


3. Use the diagram on the right to answer the following questions.

- A) Plane HKX and JLK are parallel, perpendicular, skew, or intersecting?
perpendicular
- B) Segment HJ and segment XY are parallel, perpendicular, skew, or intersecting?
parallel
- C) Name the plane parallel to plane HJZ.
(any 3 of LKXY) ex: KLY, KXL



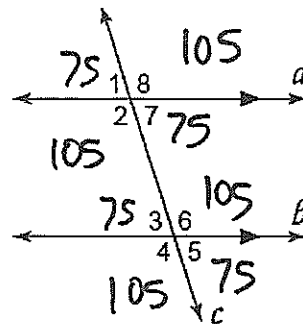
4.



In the diagram above, $a \nparallel b$. If $m\angle 1 = 78^\circ$ and $m\angle 6 = 104^\circ$, find the measures of all the missing \angle s.

$m\angle 2 = 102$, $m\angle 3 = 102$, $m\angle 4 = 78$
 $m\angle 5 = 76$, $m\angle 6 = 104$, $m\angle 8 = 76$

5.

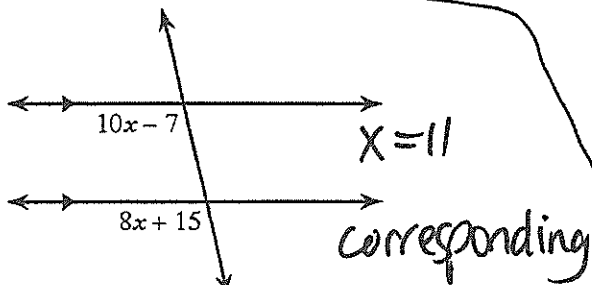


In the diagram above, $a \parallel b$. If $m\angle 8 = 105^\circ$, find the measures of all the missing \angle s.

$m\angle 2 = 105$, $m\angle 3 = 75$, $m\angle 4 = 105$
 $m\angle 5 = 75$, $m\angle 6 = 105$, $m\angle 7 = 75$

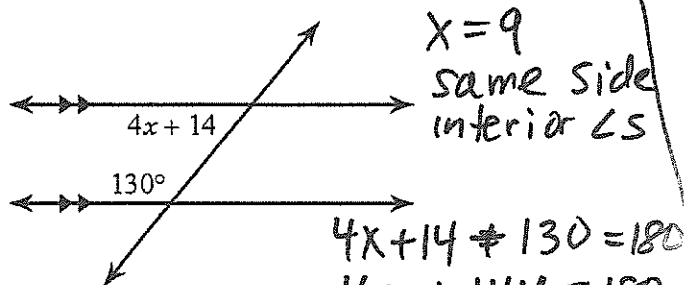
For numbers 5 – 12, solve for x and state the angle relationship that is demonstrated in the diagram.

6.



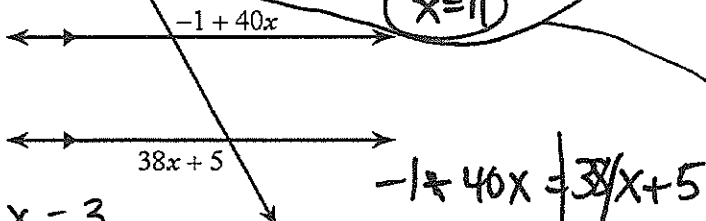
$10x - 7 = 8x + 15$
 $-8x \quad -8x$
 $2x - 7 = 15$
 $+7 \quad +7$
 $2x = 22$
 $\underline{\underline{x = 11}}$

7.



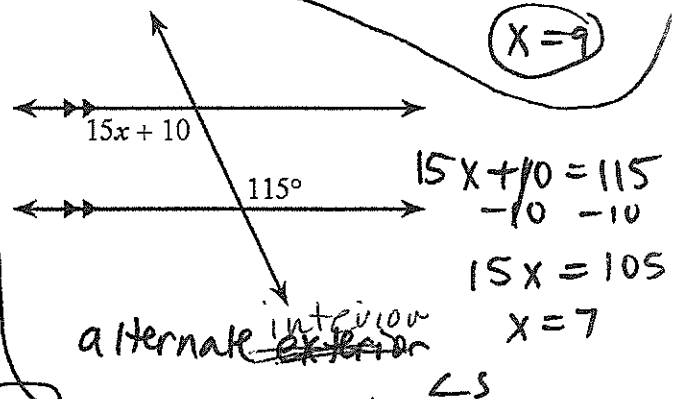
$x = 9$
 same side interior \angle s
 $4x + 14 + 130 = 180$
 $4x + 144 = 180$
 $-144 \quad -144$
 $4x = 36$
 $\underline{\underline{x = 9}}$

8.



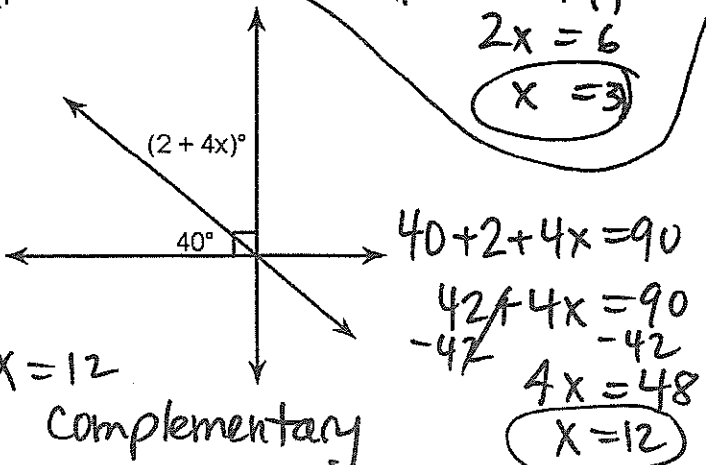
$x = 3$
 alternate ext \angle s
 $-1 + 40x = 38x + 5$
 $-38x \quad -38x$
 $-1 + 2x = 5$
 $+1 \quad +1$
 $2x = 6$
 $\underline{\underline{x = 3}}$

9.



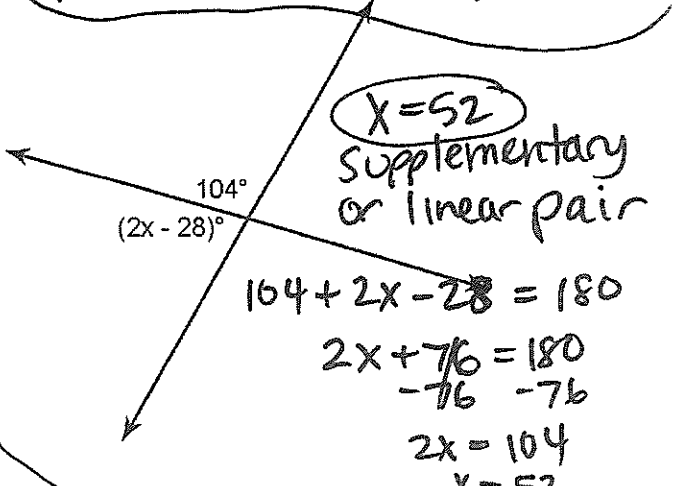
$15x + 10 = 115$
 $-10 \quad -10$
 $15x = 105$
 $x = 7$

10.



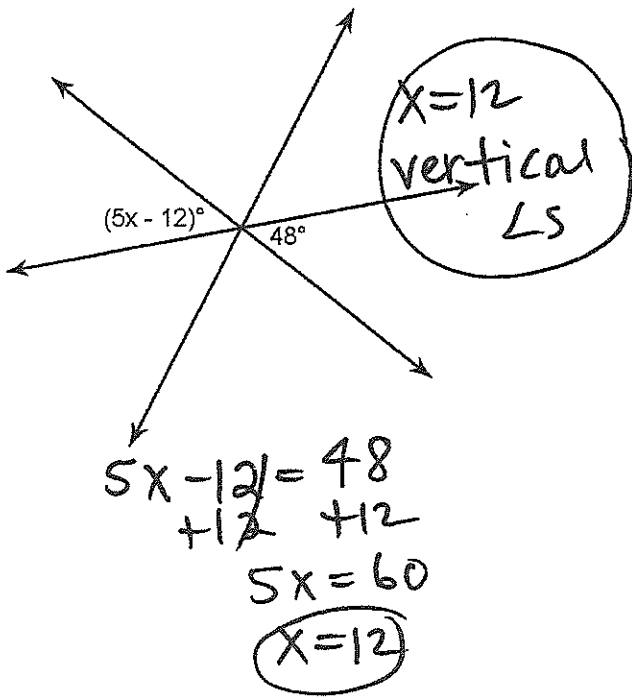
$x = 12$
 Complementary
 $40 + 2 + 4x = 90$
 $42 + 4x = 90$
 $-42 \quad -42$
 $4x = 48$
 $\underline{\underline{x = 12}}$

11.

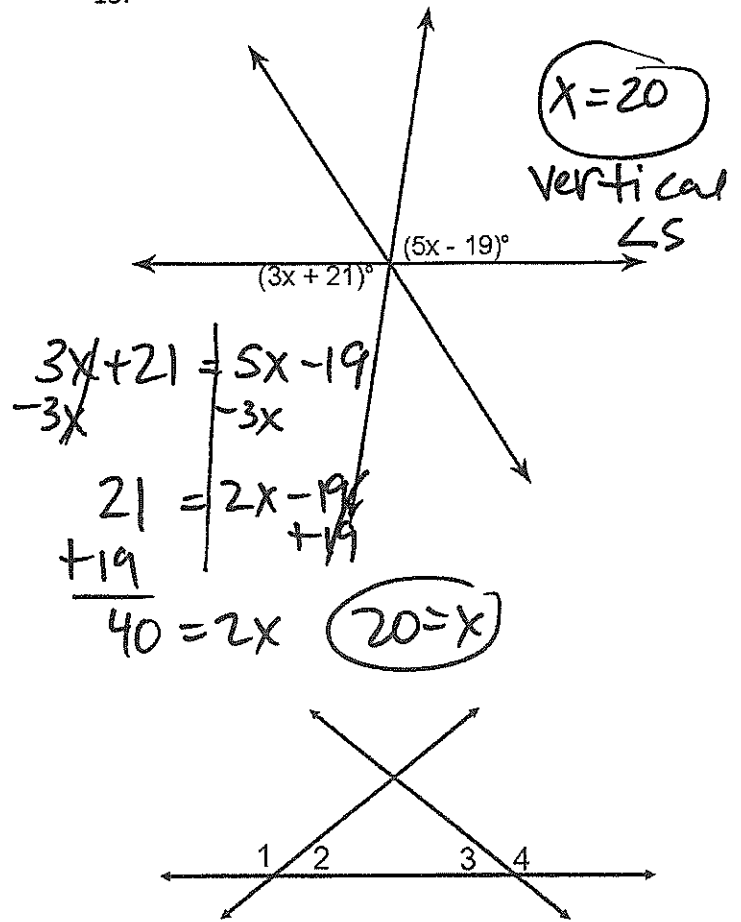


$x = 52$
 Supplementary or linear pair
 $104 + 2x - 28 = 180$
 $2x + 76 = 180$
 $-76 \quad -76$
 $2x = 104$
 $x = 52$

12.



13.



14. Given: $\angle 2 \cong \angle 3$
Prove: $\angle 1 \cong \angle 4$

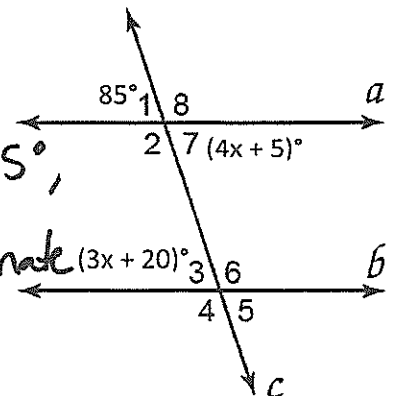
Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $\angle 1$ supp $\angle 2$, $\angle 3$ supp $\angle 4$	2. linear pair postulate
3. $\angle 1 \cong \angle 4$	3. \cong supplements thm

15. Is $a \parallel b$? Explain why or why not with complete sentences, using the following terms: vertical angles, alternate interior angles, or corresponding angles. Show the work that helped lead you to your conclusion.

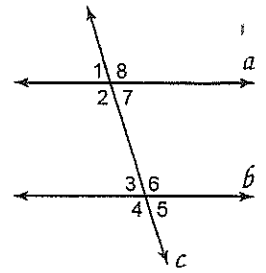
$85 = 4x + 5$
 $-5 \quad -5$
 $80 = 4x$
 $20 = x$

If $x=20$, plug into each algebraic expression to find the angle measures. $m\angle 7 = 85^\circ$, and $m\angle 3 = 80^\circ$. Therefore $a \not\parallel b$ because the alternate interior \angle s are not \cong .

$4(20) + 5 = 85$
 $3(20) + 20 = 80$



16. Prove that parallel lines make alternate interior angles congruent. (You cannot use if lines $// \rightarrow$ alt interior $\angle s \cong$, but you can use vertical and corresponding \angle theorems)

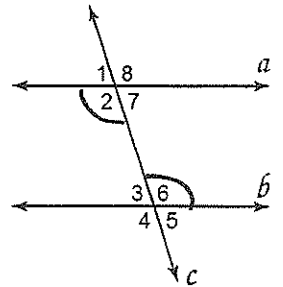


Given: $a // b$

Prove: $\angle 7 \cong \angle 3$

Statements	Reasons
1. $a // b$	1. given
2. $\angle 1 \cong \angle 3$	2. if lines $//$, corresponding $\angle s \cong$.
3. $\angle 1 \cong \angle 7$	3. vertical \angle theorem
4. $\angle 7 \cong \angle 3$	4. substitution

17. Prove if corresponding angles are congruent, then lines are parallel. (You cannot use if alternate interior $\angle s \cong \rightarrow$ lines $//$).



Given: $\angle 2 \cong \angle 6$

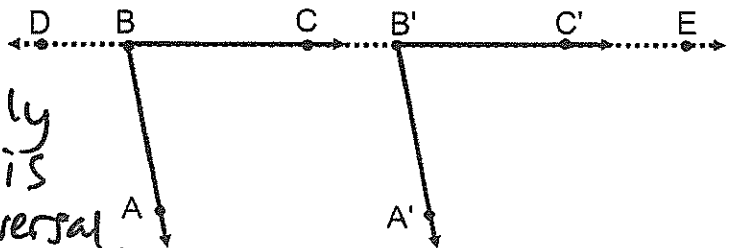
Prove: $a // b$

Statements	Reasons
1. $\angle 2 \cong \angle 6$	1. given
2. $\angle 4 \cong \angle 6$	2. vertical \angle thm
3. $\angle 2 \cong \angle 4$	3. substitution
4. $a // b$	4. if corresponding $\angle s \cong$, then lines are $//$.

18. $\angle ABC$ is translated along \overline{DE} . Explain how this transformation demonstrates the following:

If lines are $//$, then corresponding angles are \cong .

If corresponding angles are \cong , then lines are $//$.



In the diagram, \overline{DE} is basically a transversal. Since $\angle ABC$ is translating along that transversal, $AB // A'B'$, and $\angle B \cong \angle B'$. Therefore, if lines are $//$, then corresponding $\angle s$ are \cong .