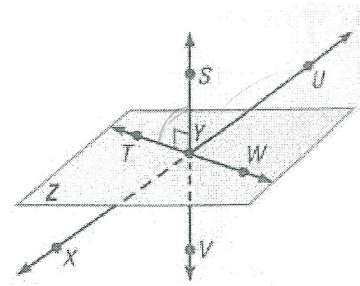


Complete the statement and name the property

- If  $m\angle JKL = m\angle GHI$  and  $m\angle GHI = m\angle ABC$ , then  $m\angle JKL = m\angle ABC$  Transitive Property
- $m\angle XYZ = m\angle XYZ$  Reflexive Property
- If  $m\angle MNO = m\angle PQR$ , then  $m\angle PQR = m\angle MNO$  Symmetric Property

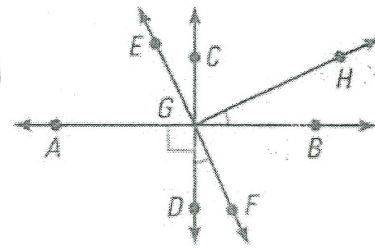
Use the diagram to determine if the statement is true or false.

- $\overrightarrow{SV} \perp$  plane Z. True; ( $\perp$  notation given)
- $\overrightarrow{XU}$  intersect plane Z at point Y. True
- $\overrightarrow{TW}$  lies in plane Z. True
- $\angle SYT$  and  $\angle WYS$  are vertical angles. False
- $\angle SYT$  and  $\angle TYV$  are complementary angles False
- $\angle TYU$  and  $\angle UYW$  are a linear pair. True
- $\angle UYV$  is acute False

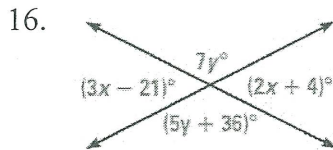


Complete the statement using the diagram.

- If  $m\angle CGF = 158^\circ$ , Then  $m\angle EGD = 158^\circ$  (vertical  $\angle$ 's)
- If  $m\angle EGA = 67^\circ$ , Then  $m\angle FGD = 23^\circ$  (complementary vertical)
- If  $m\angle FGC = 149^\circ$ , Then  $m\angle EGA = 59^\circ$  (Supp/Vertical comp)
- $m\angle DGB = 90^\circ$
- $m\angle FGH = 90^\circ$  (congruent complements Thm)



Find x and y.



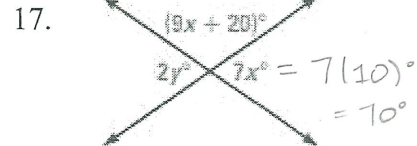
$$3x - 21 = 2x + 4$$

$$x = 25$$

$$7y = 5y + 36$$

$$2y = 36$$

$$y = 18$$



$$9x + 20 + 7x = 180$$

$$16x + 20 = 180$$

$$16x = 160$$

$$x = 10$$

$$2y = 70$$

$$y = 35$$

Solve the equation. Write a reason for each step (include substitution).

18.  $9x + 31 = -23$

Statement	Reason
1. $9x + 31 = -23$	1. Given
2. $\quad -31 \quad -31$	2. Subtraction Property
3. $9x = -54$	3. Substitution
4. $\div 9 \quad \div 9$	4. Division Property
5. $x = -6$	5. Substitution

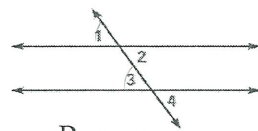
19.  $\frac{n-5}{-4} = -2$

Statement	Reason
1. $\frac{n-5}{-4} = -2$	1. Given
2. $\cdot (-4) \quad \cdot (-4)$	2. Multiplication Property
3. $n-5 = 8$	3. Substitution
4. $+5 \quad +5$	4. Addition Property
5. $n = 13$	5. Substitution

20.  $-7(-x + 2) = 42$

Statement	Reason
1. $-7(-x + 2) = 42$	1. Given
2. $-7(-x) + (-7)(2) = 42$	2. Distributive Property
3. $7x - 14 = 42$	3. Substitution
4. $+14 \quad +14$	4. Addition Property
5. $7x = 56$	5. Substitution
6. $\div 7 \quad \div 7$	6. Division Property
7. $x = 8$	7. Substitution

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

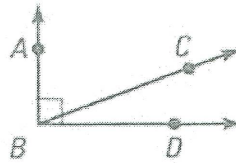


Statement	Reason
1. $\angle 1 \cong \angle 3$	1. Given
2. $\angle 1 \cong \angle 2$	2. Vertical Angles
3. $\angle 3 \cong \angle 2$	3. Transitive Property
4. $\angle 3 \cong \angle 4$	4. Vertical Angles
5. $\angle 2 \cong \angle 4$	5. Transitive Property

22. **Given:** Point C is in the interior of  $\angle ABD$

$\angle ABD$  is a right angle.

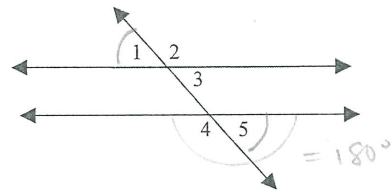
**Prove:**  $\angle ABC$  and  $\angle CBD$  are complementary



Statement	Reason
1. $\angle ABD$ is a right angle	1. <u>Given</u>
2. $m\angle ABD = 90^\circ$	2. <u>Def<sup>n</sup> of a right angle</u>
3. <u>Pt C is in <math>\angle ABD</math></u>	3. <u>Given</u>
4. <u><math>m\angle ABD = m\angle ABC + m\angle CBD</math></u>	4. <u>Angle Addition Postulate</u>
5. <u><math>90^\circ = m\angle ABC + m\angle CBD</math></u>	5. <u>Transitive Property/Substitution</u>
6. <u><math>\angle ABC</math> and <math>\angle CBD</math> are Complementary Angles</u>	6. <u>Def<sup>n</sup> of Complementary Angles</u>

23. **Given:**  $\angle 1 \cong \angle 5$

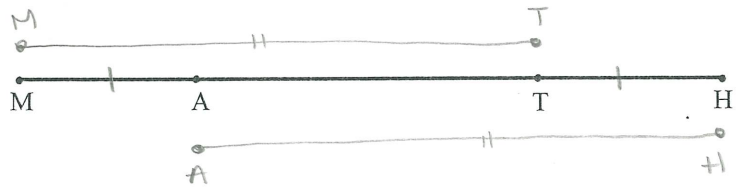
**Prove:**  $\angle 1$  is supplementary to  $\angle 4$



Statement	Reason
1. <u><math>\angle 1 \cong \angle 5</math></u>	1. <u>Given</u>
2. <u><math>m\angle 1 = m\angle 5</math></u>	2. <u>Def<sup>n</sup> of congruent segments</u>
3. <u><math>m\angle 4 + m\angle 5 = 180^\circ</math></u>	3. <u>Angle Addition</u>
4. <u><math>m\angle 4 + m\angle 1 = 180^\circ</math></u>	4. <u>Substitution</u>
5. <u><math>\angle 1</math> is supplementary to <math>\angle 4</math></u>	5. <u>Def<sup>n</sup> of Supplementary Angles</u>

24. **Given:**  $MA = TH$

**Prove:**  $MT = AH$

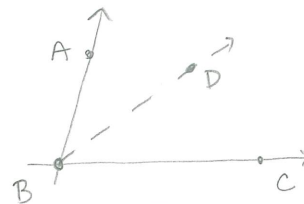


Statement	Reason
1. <u><math>MA = TH</math></u>	1. <u>Given</u>
2. <u><math>AT = AT</math></u>	2. <u>Reflexive Property</u>
3. <u><math>MT = MA + AT</math></u>	3. <u>Segment Addition</u>
4. <u><math>AH = TH + AT</math></u>	4. <u>Segment Addition</u>
5. <u><math>MT = TH + AT</math></u>	5. <u>Substitution</u>
6. <u><math>MT = AH</math></u>	6. <u>Transitive Property</u>

25. **Given:**  $\overrightarrow{BD}$  bisects  $\angle ABC$

(Draw it out!)

**Prove:**  $m\angle ABC = 2 \cdot m\angle ABD$

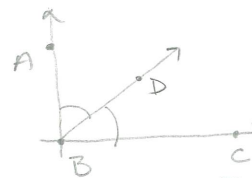


Statement	Reason
1. $\overrightarrow{BD}$ bisects $\angle ABC$	1. Given
2. $m\angle ABD = m\angle CBD$	2. Def <sup>n</sup> of Angle Bisector
3. $m\angle ABC = m\angle ABD + m\angle CBD$	3. Angle Addition
4. $m\angle ABC = m\angle ABD + m\angle ABD$	4. Substitution
5. $m\angle ABC = 2 \cdot m\angle ABD$	5. Distribution Prop / Substitution

26. **Given:**  $\angle ABC$  is a right angle  
 $\overrightarrow{BD}$  is an angle bisector

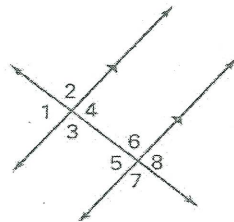
(Draw it out!)

**Prove:**  $m\angle DBC = 45^\circ$



Statement	Reason
1. $\angle ABC$ is a right angle	1. Given
1. $\overrightarrow{BD}$ is an angle bisector	2. Def <sup>n</sup> of a Right Angle
2. $m\angle ABC = 90^\circ$	3. Def <sup>n</sup> of an Angle Bisector
3. $m\angle DBC = 90^\circ/2$	4. Substitution
4. $m\angle DBC = 45^\circ$	

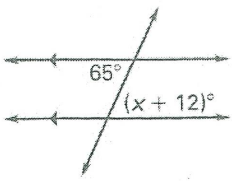
Complete the statement using the diagram.



- |   |   |
|---|---|
| 27. $\angle 1$ and $\angle 5$ are corresponding angles        | 33. $\angle 4$ and $\angle 5$ are alternate interior angles |
| 28. $\angle 4$ and $\angle 6$ are consecutive interior angles | 34. $\angle 5$ and $\angle 8$ are vertical angles           |
| 29. $\angle 3$ and $\angle 6$ are alternate interior angles   | 35. $\angle 1$ and $\angle 4$ are vertical angles           |
| 30. $\angle 5$ and $\angle 3$ are consecutive interior angles | 36. $\angle 7$ and $\angle 3$ are corresponding angles      |
| 31. $\angle 2$ and $\angle 3$ are vertical angles             | 37. $\angle 1$ and $\angle 8$ are alternate exterior angles |
| 32. $\angle 6$ and $\angle 2$ are corresponding angles        | 38. $\angle 4$ and $\angle 8$ are corresponding angles      |

Find the value of  $x$ .

39.

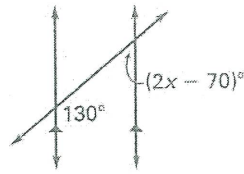


$$x + 12 = 65$$

$$x = 53$$

(Alt. Interior  $\angle$ 's)

40.



$$2x - 70 + 130 = 180$$

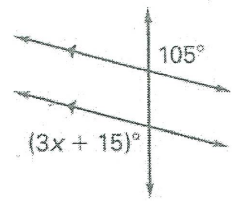
$$2x + 60 = 180$$

$$2x = 120$$

$$x = 60$$

(Consecutive Interior  $\angle$ 's)

41.



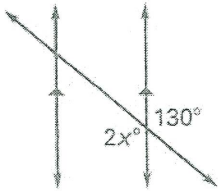
$$3x + 15 = 105$$

$$3x = 90$$

$$x = 30$$

(Alt. Exterior  $\angle$ 's)

42.

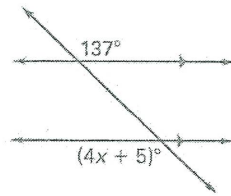


$$2x = 130$$

$$x = 65$$

(Vertical  $\angle$ 's)

43.



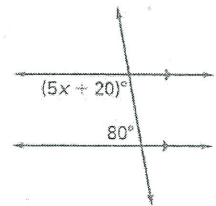
$$137 = 4x + 5$$

$$132 = 4x$$

$$33 = x$$

(Alt. Exterior  $\angle$ 's)

44.



$$5x + 20 + 80 = 180$$

$$5x + 100 = 180$$

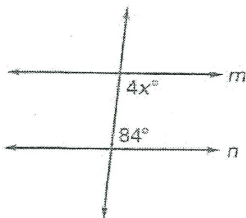
$$5x = 80$$

$$x = 16$$

(Consecutive Int  $\angle$ 's)

Find the value of  $x$  that makes  $m \parallel n$ .

45.



$$4x + 84 = 180$$

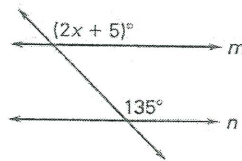
$$4x = 96$$

$$x = 24$$

(Consecutive Interior  $\angle$ 's)

\* Converse \*

46.



$$2x + 5 = 135$$

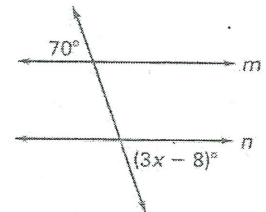
$$2x = 130$$

$$x = 65$$

(Corresponding  $\angle$ 's)

\* Converse \*

47.



$$70 = 3x - 8$$

$$78 = 3x$$

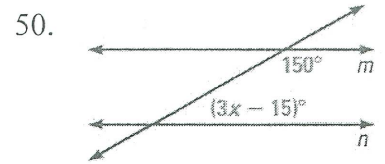
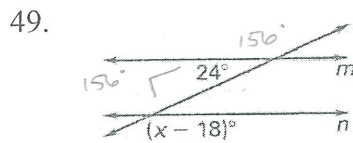
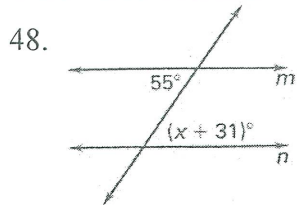
$$26 = x$$

(Alt. Exterior  $\angle$ 's)

\* Converse \*



Find the value of  $x$  that makes  $m \parallel n$ .



$$55 = x + 31$$

$$24 = x$$

(Alt. Interior  $\angle$ 's)  
\* Converse \*

$$24 + x - 18 = 180$$

$$x + 6 = 180$$

$$x = 174$$

(Alt. Ext  $\angle$ 's / Supp  $\angle$ 's)  
OR

(Vertical  $\angle$ 's / Cons Int  $\angle$ 's)  
\* Converse \*

$$3x - 15 + 150 = 180$$

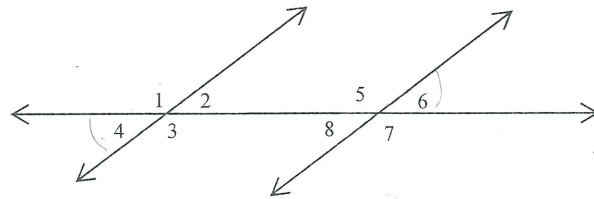
$$3x + 135 = 180$$

$$3x = 45$$

$$x = 15$$

(Consecutive Interior  $\angle$ 's)  
\* Converse \*

Use the diagram and information below to determine if there is enough information to prove  $a \parallel b$ . Write parallel or not parallel. If the lines are parallel, write which theorem or postulate justifies your answer.



51. Given:  $\angle 4 \cong \angle 6$

Yes;  $a \parallel b \Rightarrow$  Alt. Exterior Angles  
Converse

52. Given:  $\angle 4 \cong \angle 2$

No; Vertical Angles do not  
prove  $\parallel$  lines

53. Given:  $m\angle 4 + m\angle 1 = 180^\circ$

No; Linear Pairs do not  
prove  $\parallel$  lines.

54. Given:  $\angle 4 \cong \angle 8$

Yes;  $a \parallel b \Rightarrow$  Corresponding  
Angle Converse

55. Given:  $\angle 5 \cong \angle 7$

No; Vertical Angles do not  
prove  $\parallel$  lines.

56. Given:  $m\angle 2 + m\angle 5 = 180^\circ$

Yes;  $a \parallel b \Rightarrow$  Consecutive Int.  
Angles Converse

57.  $m\angle 7 + m\angle 8 = 180^\circ$

No; Linear Pairs do not  
prove  $\parallel$  lines

58. Given:  $\angle 3 \cong \angle 5$

Yes;  $a \parallel b \Rightarrow$  Alt. Interior  
Angles Converse

59. Given:  $\angle 2 \cong \angle 5$

No; Not Enough Info..

\* Consecutive Interior  $\angle$ 's  
MUST be Supplementary

60. Given:  $m\angle 3 + m\angle 6 = 180^\circ$

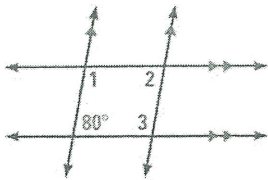
Yes,  $a \parallel b \Rightarrow m\angle 6 = m\angle 8$ . (Vertical  $\angle$ 's)

So...  $m\angle 3 + m\angle 8 = 180^\circ$

Consecutive Interior Angles  
Converse

Find  $m\angle 1$ ,  $m\angle 2$  and  $m\angle 3$ .

61.

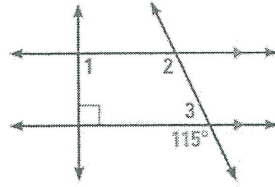


$$m\angle 1 = 100^\circ$$

$$m\angle 2 = 80^\circ$$

$$m\angle 3 = 100^\circ$$

62.

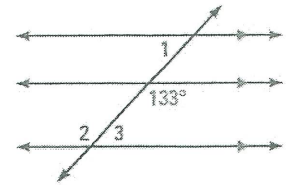


$$m\angle 1 = 90^\circ$$

$$m\angle 2 = 115^\circ$$

$$m\angle 3 = 65^\circ$$

63.



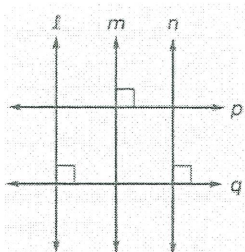
$$m\angle 1 = 47^\circ$$

$$m\angle 2 = 133^\circ$$

$$m\angle 3 = 47^\circ$$

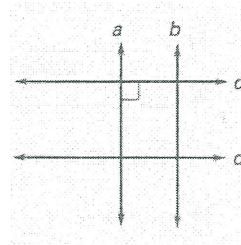
Determine which lines, if any must be parallel. **Explain.**

64.



$l \parallel n$ ; both lines are perpendicular to line  $q$ .

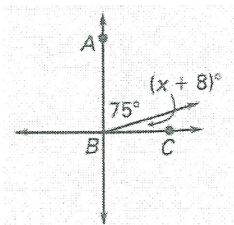
65.



None; not enough info.

In the diagram,  $\overline{AB} \perp \overline{BC}$ . Find the value of  $x$ .

66.

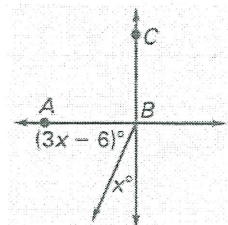


$$x + 8 + 75 = 90^\circ$$

$$x + 83 = 90^\circ$$

$$x = 7$$

67.

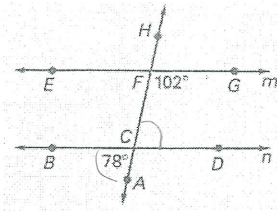


$$3x - 6 + x = 90$$

$$4x = 96$$

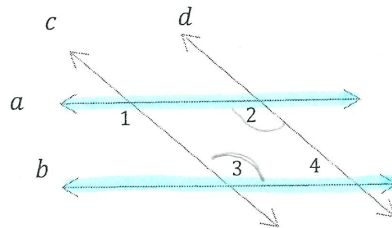
$$x = 24$$

68. **Given:**  $m\angle BCA = 78^\circ$   
 $m\angle CFG = 102^\circ$   
**Prove:**  $m \parallel n$



Statement	Reason
1. $m\angle BCA = 78^\circ$	1. <u>Given</u>
1. $m\angle CFG = 102^\circ$	
2. $\angle FCD \cong \angle BCA$	2. <u>Vertical Angles</u>
3. $m\angle FCD = m\angle BCA$	3. <u>Definition of Congruent Angles</u>
4. $m\angle FCD = 78^\circ$	4. <u>Substitution / Transitive Prop.</u>
5. $78^\circ + 102^\circ = 180^\circ$	5. <u>Angle Addition</u>
6. $m\angle FCD + m\angle CFG = 180^\circ$	6. <u>Substitution</u>
7. $\angle FCD$ and $\angle CFG$ are <u>Supp. <math>\angle</math>'s</u>	7. <u>Definition of Supplementary Angles</u>
8. $m \parallel n$	8. <u>Consecutive Interior Angles</u> <u>Converse</u>

69. **Given:**  $\angle 2 \cong \angle 3, a \parallel b$   
**Prove:**  $c \parallel d$



Statement	Reason
1. $\angle 2 \cong \angle 3$	1. <u>Given</u>
1. $a \parallel b$	
2. $m\angle 2 = m\angle 3$	2. <u>Def<sup>n</sup> of Congruent Angles</u>
3. $\angle 2$ and $\angle 4$ are <u>Supplementary <math>\angle</math>'s</u>	3. <u>Consecutive Interior Angles Theorem</u>
4. $m\angle 2 + m\angle 4 = 180^\circ$	4. <u>Def<sup>n</sup> of Supplementary Angles</u>
5. $m\angle 3 + m\angle 4 = 180^\circ$	5. <u>Substitution Property</u>
6. $\angle 3$ and $\angle 4$ are <u>supplementary</u>	6. <u>Def<sup>n</sup> of Supplementary Angles</u>
7. $c \parallel d$	7. <u>Consecutive Interior Angles</u> <u>Converse</u>