Chapter 3
Parallel and Perpendicular Lines
Study Guide

3.1 Identify Pairs of Lines/Angles	**3.2- Parallel Lines and Transversals**
Parallel Lines Parallel Postulate Perpendicular Postulate Skew Lines Parallel Planes Diagram with a cube/box Transversals Angles formed by transversals Corresponding Angles Alternate Interior Angles Alternate Exterior Angles Consecutive Interior- (Same Side Interior) Angles	****Know which angles are congruent and supplementary** Corresponding Angles Postulate Alternate Interior Angles Theorem Alternate Exterior Angles Theorem Consecutive Interior- (Same Side Interior) Angles Theorem ****Know more difficult problems with multiple lines, systems of equations and factoring! (we had 2 worksheets on this!)**
3.3 Proving Lines Parallel	**3.6 Perpendicular Lines**
Converses used to show lines are PARALLEL Corresponding Angles Converse Alternate Interior Angles Converse Alternate Exterior Angles Converse Consecutive Interior- (Same Side Interior) Angles Converse Transitive Property of Parallel Lines ****Don't Forget About: **Linear Pairs- Supplementary** **Vertical Angles- Congruent**	Theorem 3.8- Two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular Theorem 3.9- If 2 lines are perpendicular, then they intersect to form 4 right angles Right Angle Pair Theorem (3.10)- Two angles that make a right angle pair are complementary Perpendicular Transversal Theorem- If a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other Lines Perpendicular to a Transversal Theorem- If two lines are perpendicular to the same line, then they are perpendicular to each other

Part I: Circle the word that best completes the sentence.

1. If two lines are parallel, then they (ALWAYS…..SOMETIMES…..NEVER) intersect.

2. If one line is skew to another, then they are (ALWAYS…..SOMETIMES…..NEVER) coplanar.

3. If two lines intersect, then they are (ALWAYS…..SOMETIMES…..NEVER) perpendicular.

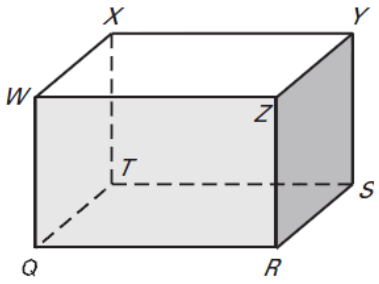
4. If two lines are coplanar, then they are (ALWAYS…..SOMETIMES…..NEVER) parallel.

5. If two lines are cut by a transversal such that the alternate interior angles are (CONGRUENT…..COMPLEMENTARY…..SUPPLEMENTARY), then the lines are parallel.

6. If two lines are cut by a transversal such that the consecutive interior angles are (CONGRUENT…..COMPLEMENTARY…..SUPPLEMENTARY), then the lines are parallel.

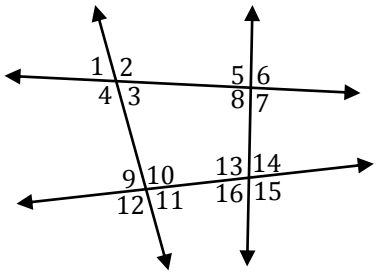
7. If two lines are cut by a transversal such that the corresponding angles are (CONGRUENT…..COMPLEMENTARY…..SUPPLEMENTARY), then the lines are parallel.

Part II: Think of each segment in the diagram as part of a line. Complete the statement with PARALLEL, SKEW, or PERPENDICULAR.



1. $\overleftrightarrow{WZ}$ *and* $\overleftrightarrow{ZR}$ are _____
2. $\overleftrightarrow{WZ}$ *and* $\overleftrightarrow{ST}$ are _____
3. $\overleftrightarrow{QT}$ *and* $\overleftrightarrow{YS}$ are _____
4. *Plane WZR* and *Plane SYZ* are _____
5. *Plane RQT* and *Plane YXW* are _____

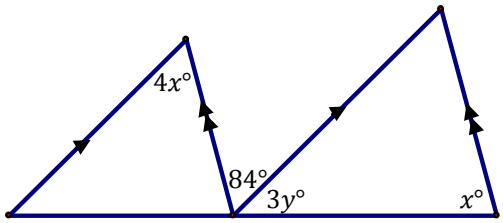
Part III: Classify the angle pair as *corresponding angles, alternate interior angles, alternate exterior angles, same side (consecutive) interior angles, vertical angles, linear pair, or none.*



1. ∡1 *and* ∡5 _____
2. ∡4 *and* ∡6 _____
3. ∡5 *and* ∡16 _____
4. ∡16 *and* ∡10 _____
5. ∡10 *and* ∡12 _____
6. ∡11 *and* ∡16 _____
7. ∡12 *and* ∡14 _____
8. ∡4 *and* ∡14 _____
9. ∡7 *and* ∡13 _____
10. ∡12 *and* ∡5 _____
11. ∡6 *and* ∡7 _____
12. ∡10 *and* ∡13 _____

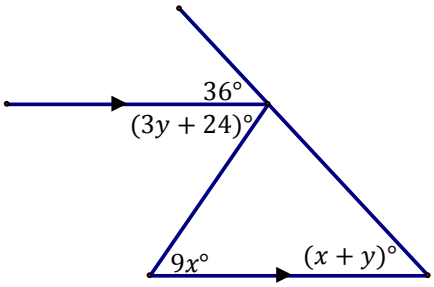
Part IV: Find the value of the variables.

1.



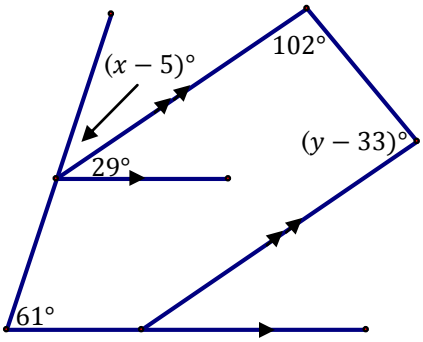
$x =$ _____ $y =$ _____

2.



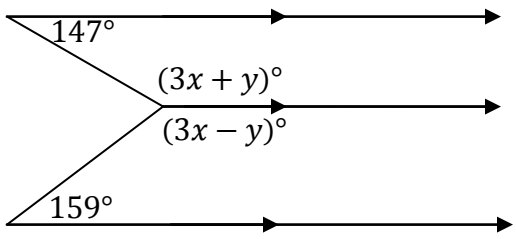
$x =$ _____ $y =$ _____

3.



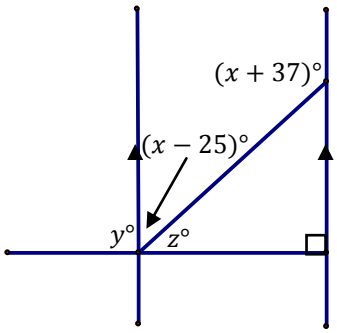
$x =$ _____ $y =$ _____

4.



$x =$ _____ $y =$ _____

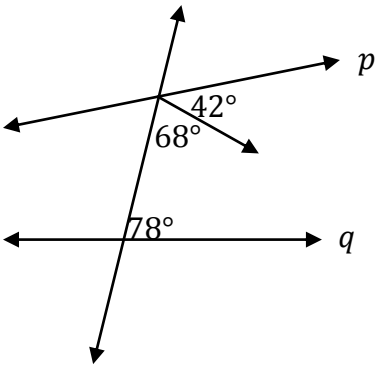
5.



$x =$ _____ $y =$ _____ $z =$ _____

Part V. Is there enough information to state that lines p and q are parallel? If so, state the reason.

1.

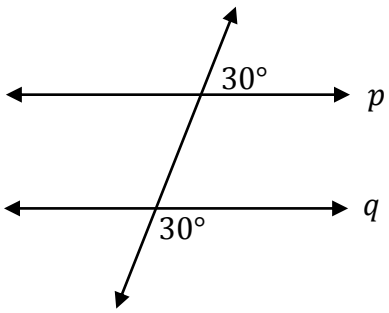


Yes_____ No_____

Reason (if necessary)_____

_____

2.

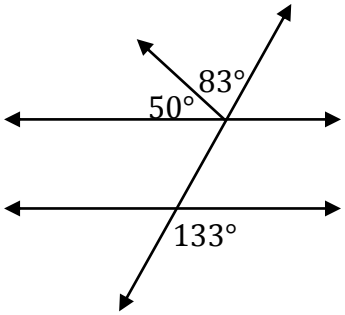


Yes_____ No_____

Reason (if necessary)_____

_____

3.

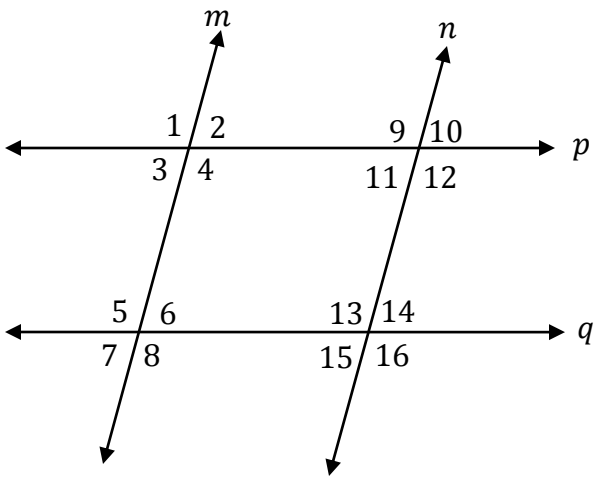


Yes_____ No_____

Reason (if necessary)_____

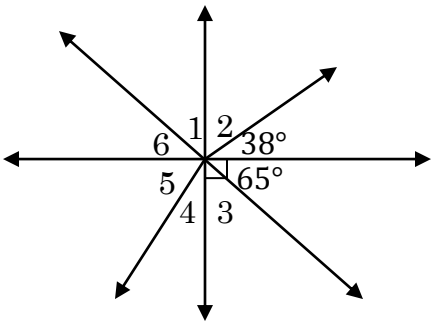
_____

Part VI. Use the diagram and the given information to determine if $m \parallel n,\ p \parallel q$, or neither.



1. $\measuredangle 3 \cong \measuredangle 10$ _____
2. $\measuredangle 1 \cong \measuredangle 13$ _____
3. $\measuredangle 4 \cong \measuredangle 11$ _____
4. $m\measuredangle 11 + m\measuredangle 13 = 180°$ _____
5. $\measuredangle 12 \cong \measuredangle 13$ _____
6. $m\measuredangle 6 + m\measuredangle 13 = 180°$ _____
7. $\measuredangle 3 \cong \measuredangle 14$ _____

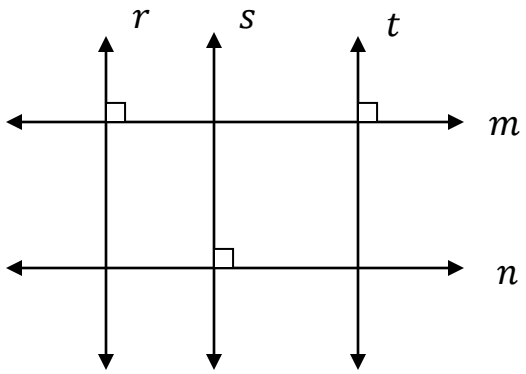
Part VII. Find the measure of the indicated angle.



$\measuredangle 6 \cong \measuredangle 5$

1. $m\measuredangle 1 =$_____
2. $m\measuredangle 2 =$_____
3. $m\measuredangle 3 =$_____
4. $m\measuredangle 4 =$_____
5. $m\measuredangle 5 =$_____
6. $m\measuredangle 6 =$_____

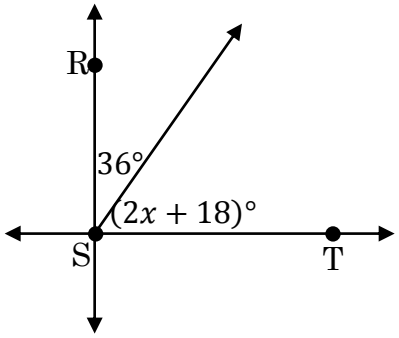
Part VIII. Use the diagram.



1. Is r∥ s ? Yes_____ No_____
2. Is $m \parallel n$ Yes_____ No_____
3. Is r∥ t Yes_____ No_____

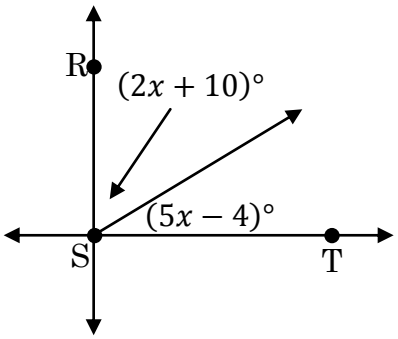
Part IX. In the diagram, $\overleftrightarrow{RS} \perp \overleftrightarrow{ST}$. Find the value of x.

1.



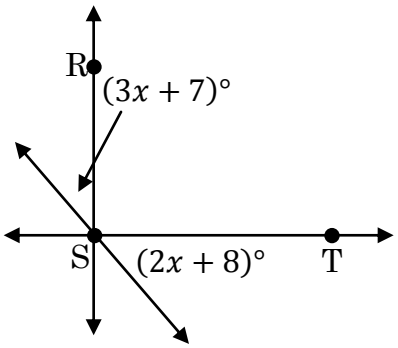
x =_____

2.



x =_____

3.



x =_____

Chapter 3 Review Solutions

Part I:

1) Never
2) Never
3) Sometimes
4) Sometimes
5) Congruent
6) Supplementary
7) Congruent

Part II:

1) Perpendicular
2) Parallel
3) Skew
4) Perpendicular
5) Parallel

Part III:

1) Corresponding angles
2) Alternate exterior angles
3) None
4) Alternate interior angles
5) Vertical angles
6) Consecutive interior angles (same side interior)
7) Alternate exterior angles
8) None
9) Alternate interior angles
10) None
11) Linear Pairs
12) Consecutive Interior

Part IV:

1) x = 21, y = 25
2) x = 11, y = 25 (system of equations)
3) x = 37, y = 111
4) x = 9, y = 6 (system of equations)
5) x = 84, y = 90, z = 31

Part V:

1) No, the sum of the angles is not 180 degrees
2) No, Corr. Angles are not congruent (one way to show)
3) Yes, alternate exterior angles converse (angles are congruent)

Part VI:

1) m ∥ n Alt. Int. Converse
2) Neither-No transversal
3) Neither- Need to be sup.
4) p ll q Consec. Int. Converse
5) p ∥ q Alt. Int. Converse
6) m ll n Consec. Int. Converse
7) none- No Transversal

Part VII:

1) 25
2) 52
3) 25
4) 25
5) 65
6) 65

Part VIII:

1) Not enough information
2) Not enough information
3) Yes, both lines perpendicular to m

Part IX:

1) x = 18
2) x = 12
3) x = 15