

Unit 11 Check Sheet

Name _____ Per _____

Proving Theorems about Lines & Angles (Print)

- Check sheet must be turned in to receive Homework & Quiz points.
- All quiz corrections must be done for test score to replace quiz scores.
- No check sheet = No Points.
- Write quiz scores as fractions
- Lost Quizzes count as a 0.
- Quiz ratio is total points scored on quizzes and pre-test out of total possible
- Order (from top to bottom)
 - Check sheet,
 - **Quiz 1, 2, Pre-Test**
 - **Quiz corrections**

Section	HMK
11.1 Lines and Angles Worksheet 11.1 #1-18all	
11.2 Properties of Parallel Lines Worksheet 11.2 #1-14 all	
11.3 Proving Lines Parallel Worksheet 11.3 #1-17 all Quiz 1	
11.4 Parallel and Perpendicular Lines Worksheet 11.4 #1-10 all	
11.5 Parallel Lines and Triangles Worksheet 10.7 #1-20 all Quiz 2	
Review Review WS 1 #1-26 all	
Unit Test	

Quiz 1: _____ Score/Possible

Quiz 2: _____ Score/Possible

Pre-Test: _____ Score/Possible

Total Quiz Ratio: _____ Total Score/Total Possible

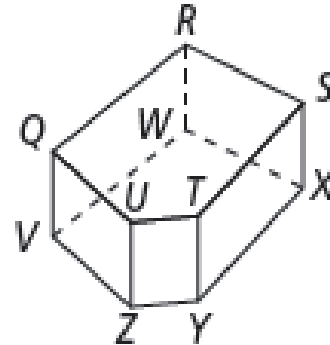
11.1 Practice

Form K

Lines and Angles

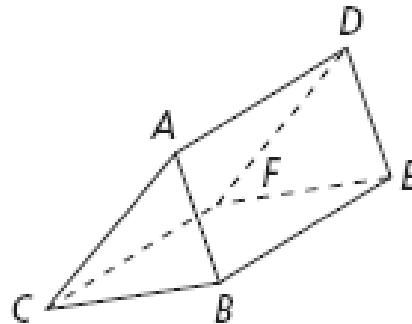
Use the diagram to name each of the following.

1. a plane
2. a pair of parallel planes
3. all lines that are parallel to \overline{QR}
4. two lines that are skew to \overline{ST}
5. all lines that are parallel to plane $TSXY$



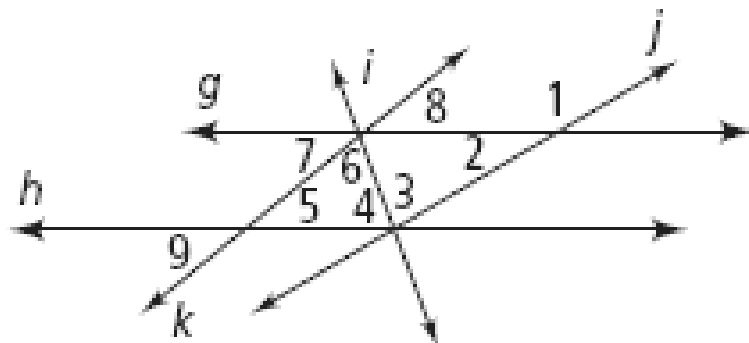
In Exercises 6–9, describe the statement as *true* or *false*. If false, explain.

6. $\overline{AB} \parallel \overline{DE}$
7. plane $ABE \parallel$ plane ACF
8. plane $ABC \parallel$ plane DEF
9. \overline{AD} and \overline{BE} are skew lines.



Identify all pairs of each type of angles in the diagram. Name the two lines and the transversal that form each pair.

10. corresponding angles
11. alternate interior angles
12. same-side interior angles
13. alternate exterior angles



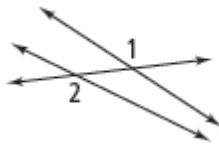
Practice (continued)

Form K

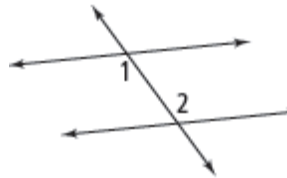
Lines and Angles

Decide whether each pair of angles labeled are *alternate interior angles*, *same-side interior angles*, *corresponding angles*, or *alternate exterior angles*.

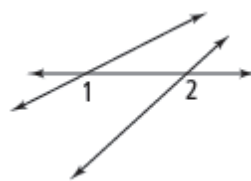
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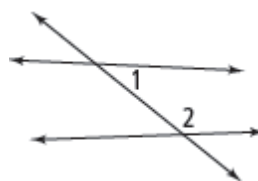
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16.

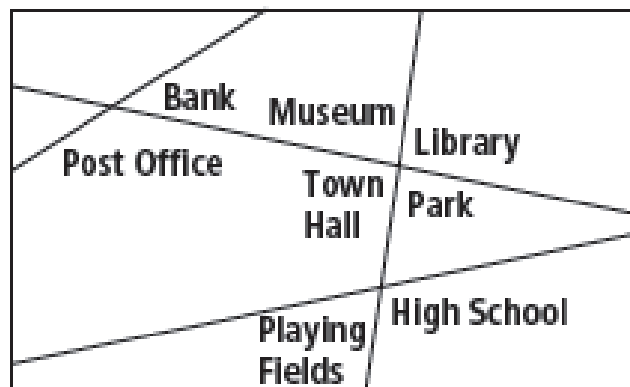


17.



18. The map at the right shows the downtown area of a city. Name two pairs of locations that represent each type of angle.

- a. alternate interior angles
- b. same-side interior angles
- c. alternate exterior angles
- d. corresponding angles



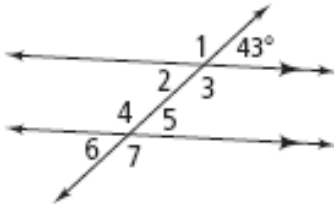
11.2 Practice

Form K

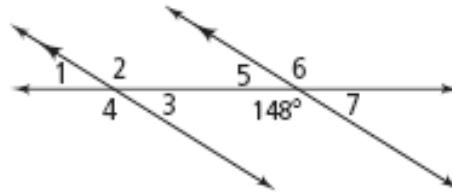
Properties of Parallel Lines

Identify all the numbered angles that are congruent to the given angle. Justify your answers.

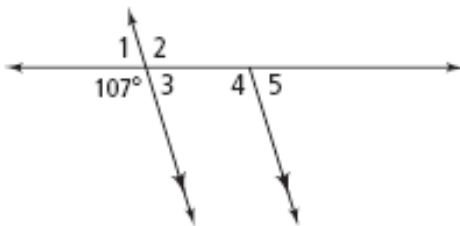
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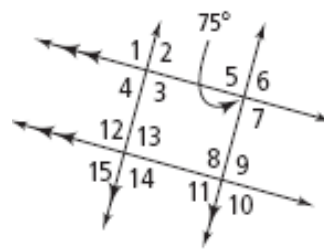
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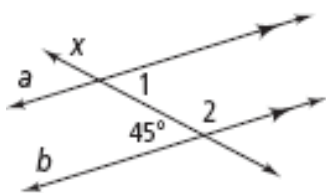


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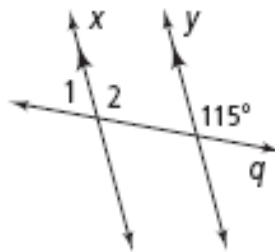


Find $m\angle 1$ and $m\angle 2$. Justify each answer.

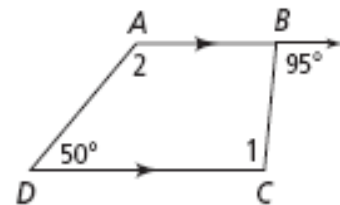
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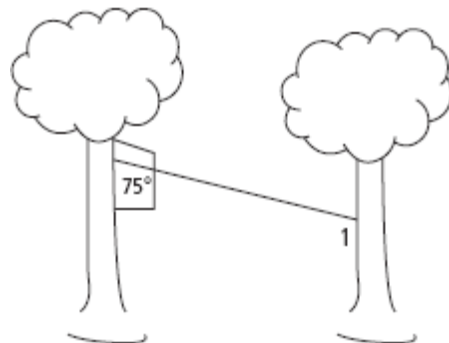
7.



8. Ana made a zip line for her tree house. To do this, she attached a pulley to a cable. She then strung the cable at an angle between the tree house and another tree. She made the drawing of the zip line at the right. The two trees are parallel.

a. What is the measure of $\angle 1$?

b. Are $\angle 1$ and the given angle *same-side interior angles*, *alternate interior angles*, or *corresponding angles*?



Practice (continued)

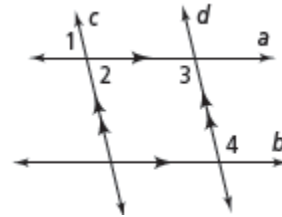
Form K

Properties of Parallel Lines

9. Developing Proof Supply the missing reasons in the two-column proof.

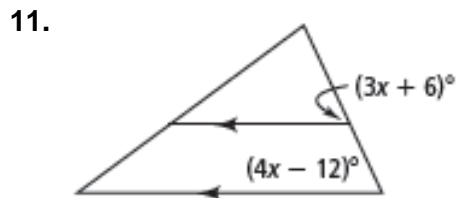
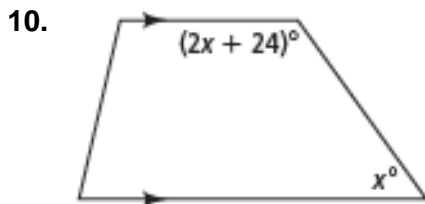
Given: $a \parallel b, c \parallel d$

Prove: $\angle 1$ and $\angle 4$ are supplementary

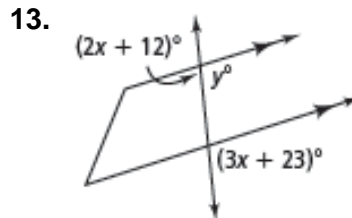
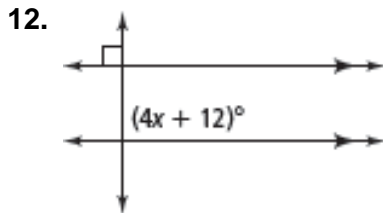


Statements	Reasons
1) $\angle 1 \cong \angle 2$	1) ?
2) $c \parallel d$	2) Given
3) $\angle 2$ and $\angle 3$ are supplementary.	3) ?
4) $a \parallel b$	4) Given
5) $\angle 3 \cong \angle 4$	5) ?
6) $\angle 1$ and $\angle 4$ are supplementary.	6) ?

Algebra Find the value of x . Then find the measure of each labeled angle.



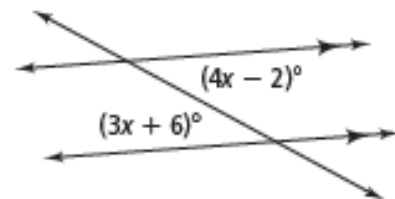
Algebra Find the values of the variables.



14. Error Analysis Which solution for the value of x in the figure at the right is incorrect? Explain.

A.
$$4x - 2 = 3x + 6$$
$$x = 8$$

B.
$$4x - 2 + 3x - 6 = 180$$
$$7x - 8 = 180$$
$$x = 24.6$$



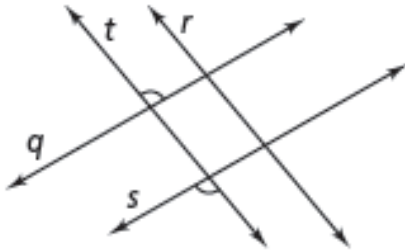
11.3 Practice

Form K

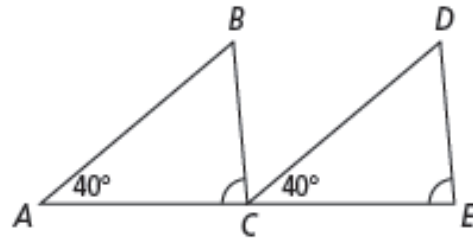
Proving Lines Parallel

Which lines or segments are parallel? Justify your answer.

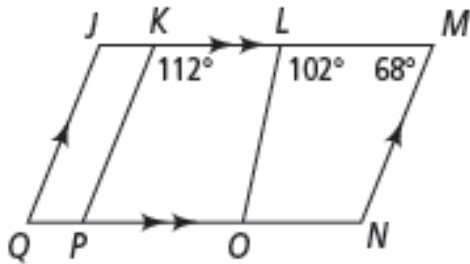
1.



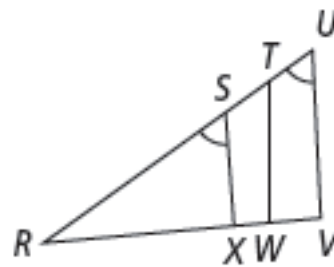
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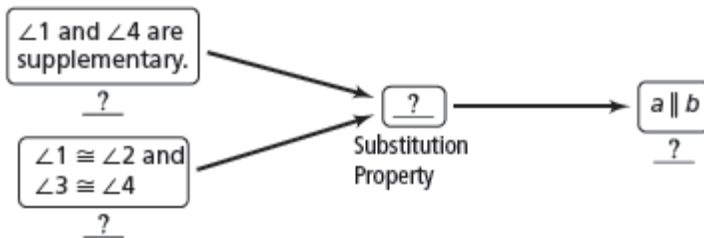
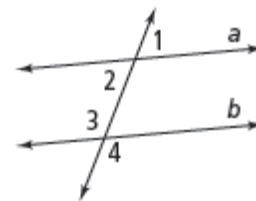
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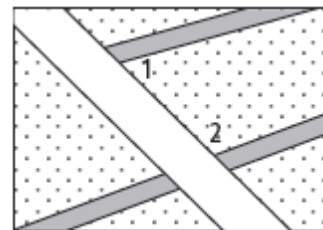
5. **Developing Proof** Complete the flow proof below.

Given: $\angle 1$ and $\angle 4$ are supplementary.

Prove: $a \parallel b$



6. Mrs. Jensen made a quilt for her nephew. The pattern for one block is shown at the right. If $m\angle 1 = 60$ and $m\angle 2 = 115$, are the two gray strips of fabric parallel? Explain.



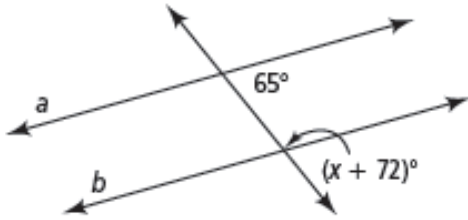
Practice (continued)

Form K

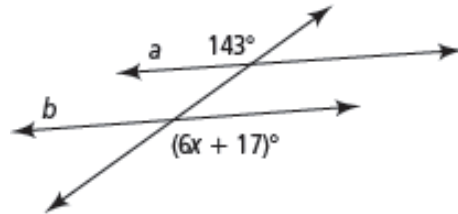
Proving Lines Parallel

Algebra Find the value of x for which $a \parallel b$.

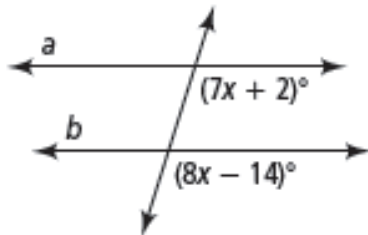
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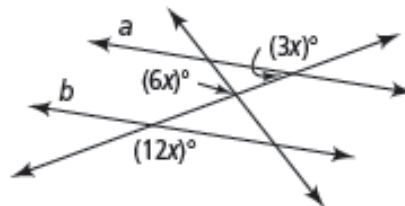
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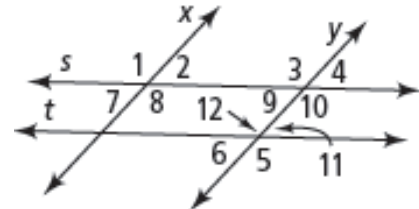
9.



10.



Developing Proof Use the given information to determine which lines, if any, are parallel. Justify each conclusion with a theorem or postulate.



11. $\angle 8$ is supplementary to $\angle 9$.

12. $\angle 7 \cong \angle 4$

13. $\angle 9$ is supplementary to $\angle 12$.

14. $\angle 9 \cong \angle 11$

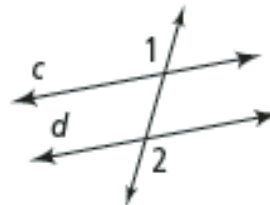
15. Error Analysis A classmate said that $\overline{AB} \parallel \overline{DC}$ based on the diagram at the right. Explain your classmate's error.



Algebra Determine the value of x for which $c \parallel d$. Then find $m\angle 1$ and $m\angle 2$.

16. $m\angle 1 = 100 - x, m\angle 2 = 40 + 2x$

17. $m\angle 1 = 90 - 6x, m\angle 2 = 100 - 8x$

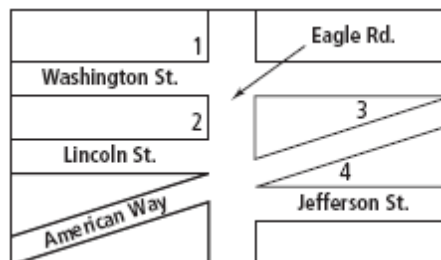


11.4 Practice

Form K

Parallel and Perpendicular Lines

1. A developer is planning a new housing complex. The map of the complex is shown at the right. Assume that all streets lie in a plane.

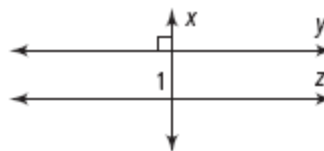


a. If Washington and Lincoln Streets are to be parallel, what must be true of $\angle 1$ and $\angle 2$?

b. Which streets must be parallel if $\angle 3 \cong \angle 4$? Justify your answer.

c. If $m\angle 1 = 90$ and your answers to parts (a) and (b) are true, to what roads is Eagle Road perpendicular?

2. **Developing Proof** Copy and complete this paragraph proof of the Perpendicular Transversal Theorem (Theorem 3-10).



Given: In a plane, $x \perp y$ and $y \parallel z$.

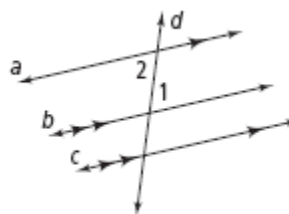
Prove: $x \perp z$

Since $y \parallel z$, $m\angle 1 = \underline{\quad ? \quad}$ by the $\underline{\quad ? \quad}$.
By the definition of $\underline{\quad ? \quad}$ lines, $x \perp \underline{\quad ? \quad}$.

3. Write a paragraph proof.

Given: $a \parallel c$; $b \parallel c$; $m\angle 2 = 65$

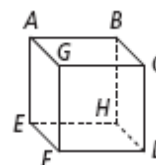
Prove: $m\angle 1 = 65$



4. **Error Analysis** A classmate drew the cube at the right.

He said that according to Theorem 3-9, $\overline{AB} \parallel \overline{CD}$, since

they are both perpendicular to \overline{BC} . Explain your classmate's error.

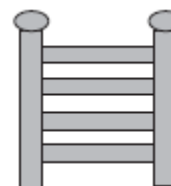


Practice (continued)

Form K

Parallel and Perpendicular Lines

The following statements describe the rungs and posts that form the back of a chair. Assume that the rungs and posts all lie in a plane. Based only on the statements, make a conclusion about the rungs, one post, or both posts of the chair back. Explain.



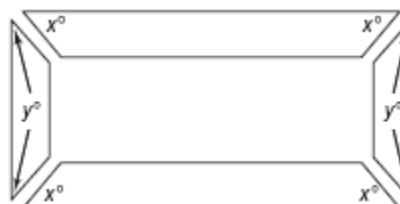
5. The rungs are parallel and the top one is perpendicular to the left post.

6. The right post is perpendicular to all the rungs.

7. The rungs are parallel. The last rung is perpendicular to the right post and the first rung is perpendicular to the left post.

8. **Draw a Picture** Draw the map of a town to meet the conditions below. Based on the map, explain how each street is related to the other streets. Assume that all streets lie in a plane.
 - First Street is parallel Third Street.
 - Second Avenue is parallel to Third Street.
 - Third Street is perpendicular to Main Street.
 - Main Street is perpendicular to North Avenue.

9. **Open-Ended** Cheryl is making a picture frame out of scraps of wood. List three pairs of values for x and y for which the sides of the frame will be parallel. Explain how you determined the values.



10. **Reasoning** Lines a , b , c , and d are in the same plane. Line a is parallel to line c . Lines b and c are perpendicular to line d . Based on this, tell how the lines listed below are related. Justify your answers.
 - a. lines a and b

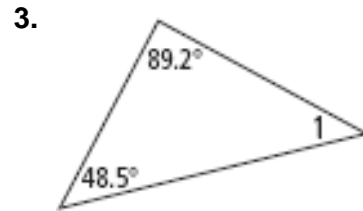
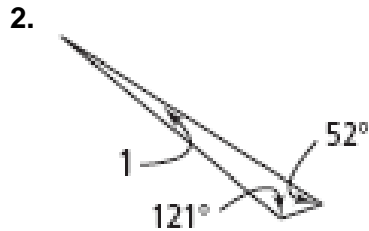
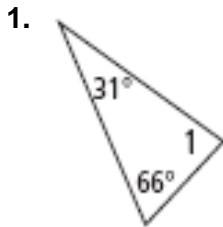
 - b. lines a and d

11.5 Practice

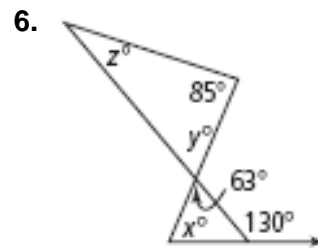
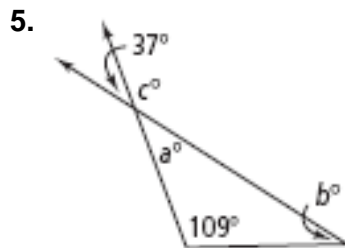
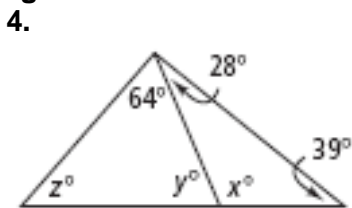
Form K

Parallel Lines and Triangles

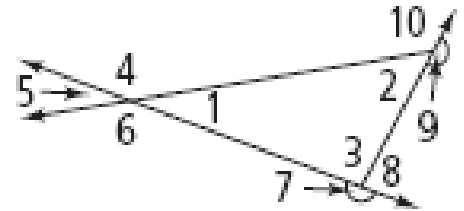
Find $m\angle 1$.



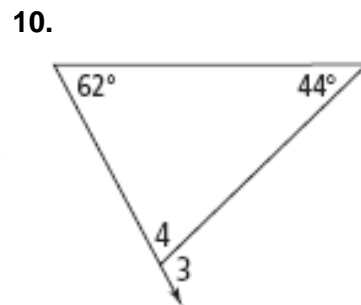
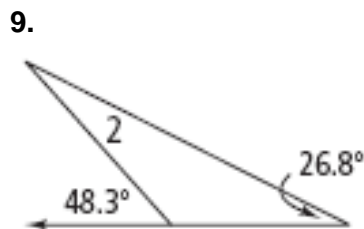
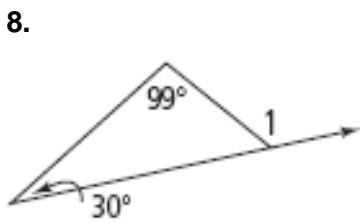
Algebra Find the value of each variable.



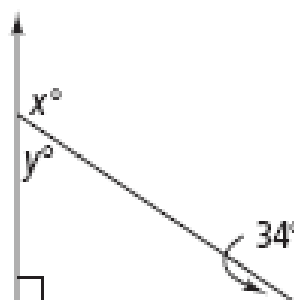
7. a. Which of the numbered angles are exterior angles?
 b. Name the remote interior angles for each exterior angle.
 c. Which two exterior angles share the same remote interior angles? Explain.



Algebra Find each missing angle measure.



11. What are the values of x and y in the right triangle?

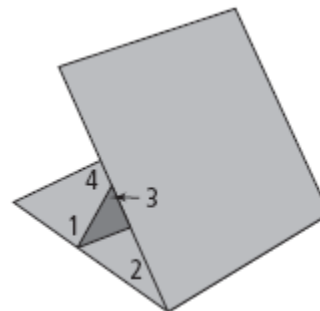


Practice (continued)

Form K

Parallel Lines and Triangles

12. A tabletop easel has different angle settings.
If $m\angle 1 = 75$ and $m\angle 2 = 40$, what is $m\angle 4$?

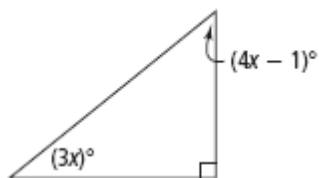


Algebra Use the given information to find the unknown measures in the triangle.

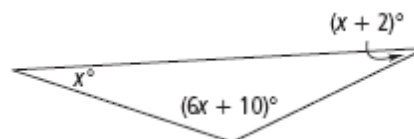
13. The ratio of the angle measures of the acute angles in a right triangle is 1 : 3.
14. The measure of one angle of a triangle is 61. The other two angles are in a ratio of 2 : 5.
15. The measure of the exterior angle of a triangle is 110. The measures of its remote interior angles are in a ratio of 2 : 3.
16. **Think About a Plan** The measure of an exterior angle of $\triangle DEF$ is $4x$. The measure of one of this angle's remote interior angles is $x + 23$. The measure of the other remote interior angle is $2x + 12$. Find the value of x , the measure of each angle of the triangle, and the measure of the exterior angle.
- How can drawing a picture help you find the answers?
 - How are the exterior angle and the third angle of the triangle related?

Find the values of the variables and the measures of the angles.

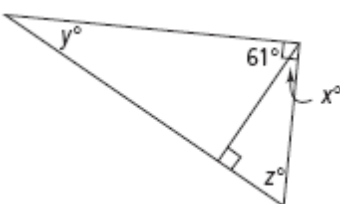
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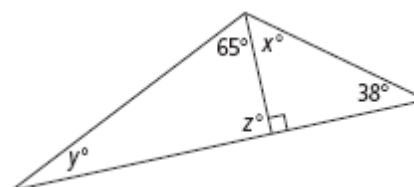
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19.



20.



Math 1 Unit 11
Review Worksheet

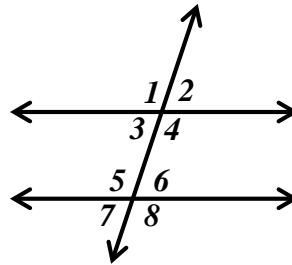
Name _____
Date _____ Per _____

Note: Diagrams are not drawn to scale.

In problems 1 – 6, identify the pairs of angles below as:

- A. Corresponding B. Alternate Interior C. Alternate Exterior
D. Same Side Interior (Consecutive) E. Vertical

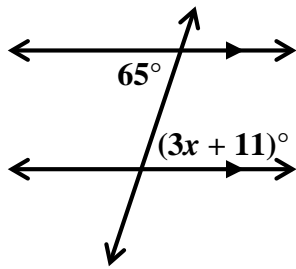
1. $\angle 3$ and $\angle 6$
2. $\angle 2$ and $\angle 7$
3. $\angle 4$ and $\angle 8$
4. $\angle 5$ and $\angle 8$
5. $\angle 3$ and $\angle 5$
6. $\angle 1$ and $\angle 8$



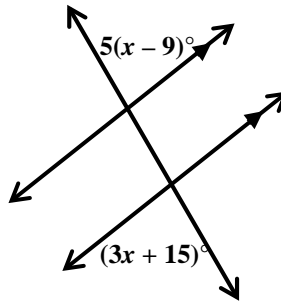
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

In problems 7 - 14 solve for the missing variables. Show all work. Circle your answer.

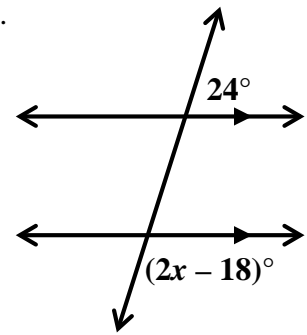
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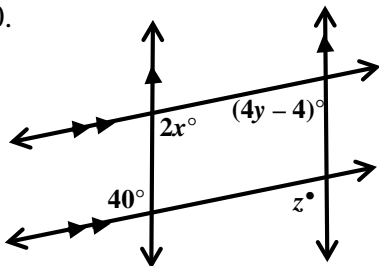
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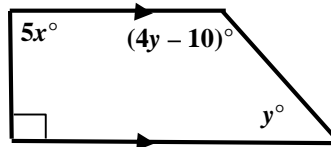
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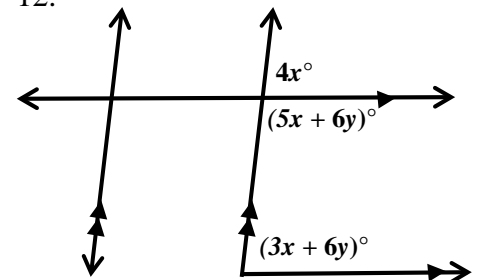
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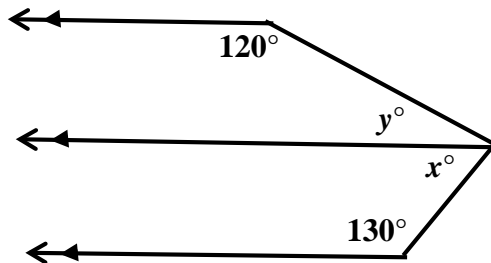
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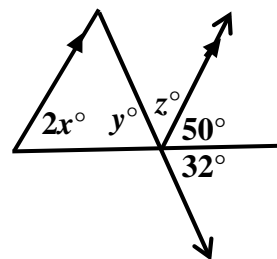
12.



13.



14.



Using the information in problems 15 - 19 determine which lines **MUST** be parallel. If no lines are parallel write 'none'. Justify your answers.

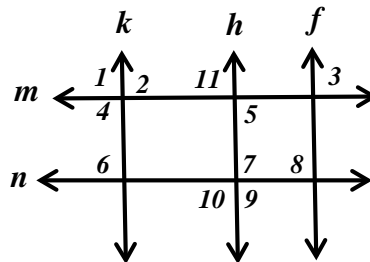
15. $m\angle 1 = m\angle 11$

16. $m\angle 2 = m\angle 4$

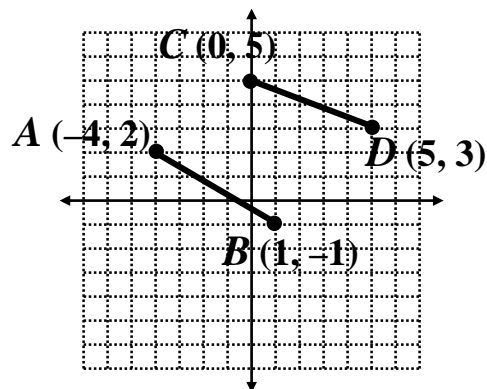
17. $m\angle 5 + m\angle 7 = 180^\circ$

18. $m\angle 9 = m\angle 8$

19. $m\angle 3 = m\angle 4$



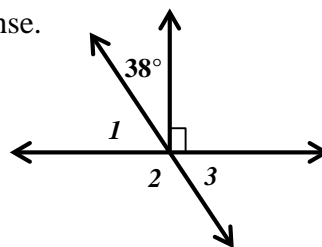
20. Determine mathematically if \overline{AB} is parallel to \overline{CD}



In problems 21 – 27 select the correct multiple choice response.

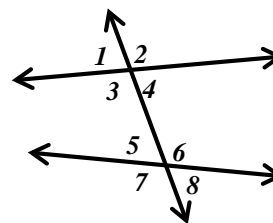
21. What is the measure of $\angle 2$?

- A. 38°
- B. 128°
- C. 52°
- D. 142°



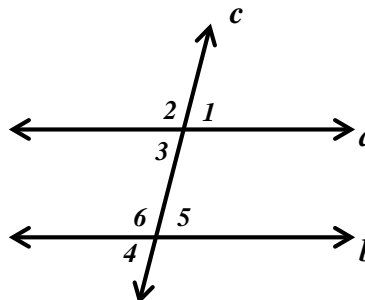
22. Which angles in the diagram are **NOT** corresponding angles?

- A. $\angle 1$ and $\angle 5$
- B. $\angle 2$ and $\angle 6$
- C. $\angle 4$ and $\angle 8$
- D. $\angle 2$ and $\angle 7$



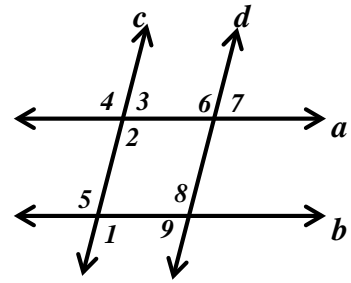
23. In the diagram $a \parallel b$. Which of the following conclusions does **NOT** have to be true?

- A) $\angle 1 \cong \angle 5$
- B) $\angle 3 \cong \angle 5$
- C) $\angle 3 \cong \angle 6$
- D) $\angle 1 \cong \angle 4$



24. In the diagram $a \parallel b$ and $c \parallel d$.
Which of the following conclusions does **NOT** have to be true?

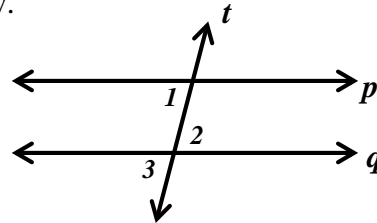
- A) $\angle 4 \cong \angle 8$
 B) $\angle 3 \cong \angle 7$
 C) $\angle 7 \cong \angle 9$
 D) $\angle 5 \cong \angle 7$



25. Use the proof to answer the question below.

Given: $p \parallel q$

Prove: $\angle 1 \cong \angle 2$



Statements

1. $p \parallel q$
2. $\angle 1 \cong \angle 3$
3. $\angle 3 \cong \angle 2$
4. $\angle 1 \cong \angle 2$

Reasons

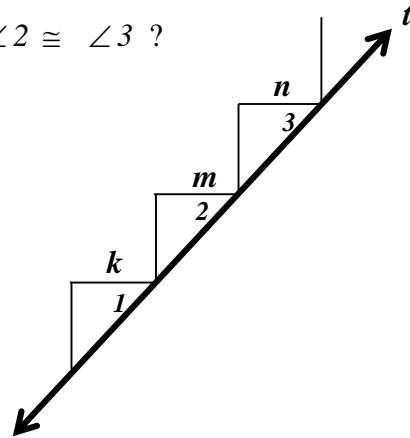
1. Given
- 2.
3. Vertical angles are congruent
4. Transitive Property

What reason can be used to justify statement 2?

- A. Corresponding angles are congruent
 B. Alternate interior angles are congruent
 C. Alternate exterior angles are congruent
 D. Consecutive interior angles theorem

26. Given: $k \parallel m \parallel n$
Which statement justifies the conclusion that $\angle 1 \cong \angle 2 \cong \angle 3$?

- A. If $k \parallel m \parallel n$ and are cut by transversal t , then alternate interior angles are congruent.
 B. If $k \parallel m \parallel n$ and are cut by transversal t , then vertical angles are congruent.
 C. If $k \parallel m \parallel n$ and are cut by transversal t , then alternate exterior angles are congruent.
 D. If $k \parallel m \parallel n$ and are cut by transversal t , then corresponding angles are congruent.



Math 1 Unit 11 in one day – class notes (Homework Unit 11 Chapter Review p 703-705 # 5-15, 19-23)

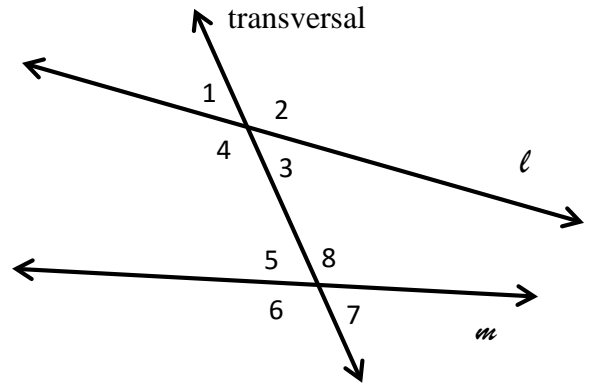
1.1 Terminology

1. parallel lines

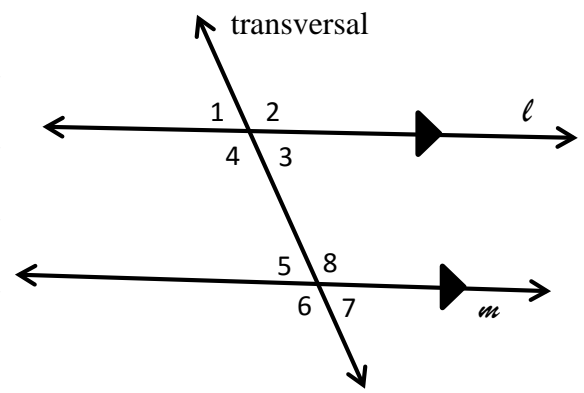
2. Skew lines

3. Parallel planes

4. alternate interior angles
5. Same side interior angles
6. Corresponding angles
7. Alternate exterior angles

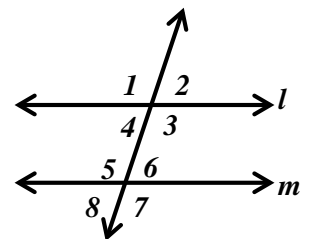


8. If lines are parallel then _____
9. If lines are parallel then _____
10. If lines are parallel then _____
11. If lines are parallel then _____



12a. How can you prove lines parallel?

- If _____ then line parallel.
- If _____ then line parallel.
- If _____ then line parallel.
- If _____ then line parallel.
- If _____ then line parallel.



12b. Discuss with your neighbor what we have talked about so far using the geometry vocabulary above.

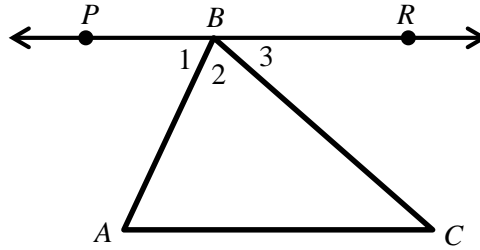
13. Parallel Lines and Triangles

- a. (Postulate) Through a point not on a line, there is one and only one line parallel to a given line.
- b. Prove Theorem – The sum of the measures of the angles of a triangle is 180° .

Given: $\triangle ABC$

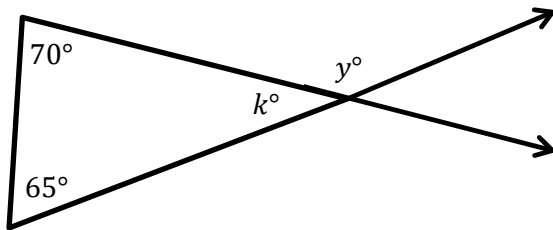
Prove: $m\angle A + m\angle 2 + m\angle C = 180^\circ$

Sum of 3 interior angles in a triangle is 180°

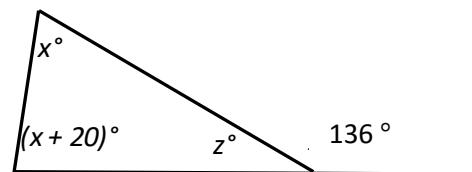


Statements	Reasons
1. Draw \overleftrightarrow{PR} through R, parallel to \overleftrightarrow{AC}	1. Through a point not on a line, there is one and only one line parallel to the given line.
2. $\angle PBC$ and $\angle 3$ are supplementary	2. _____
3. $m\angle PBC + m\angle 3 = 180^\circ$	3. _____
4. $m\angle PBC = m\angle 1 + m\angle 2$	4. _____
5. $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$	5. _____
6. $\angle 1 \cong \angle A$ and $\angle 3 \cong \angle C$	6. _____
7. $m\angle 1 = m\angle A$ and $m\angle 3 = m\angle C$	7. _____
8. $m\angle A + m\angle 2 + m\angle C = 180^\circ$	8. _____

14a.



14b.



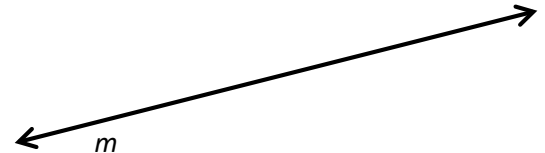
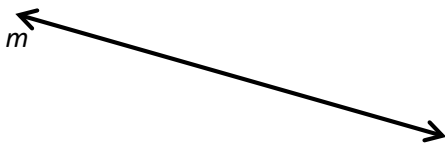
15. Construct a line through point J that is parallel to line m

a.

J •

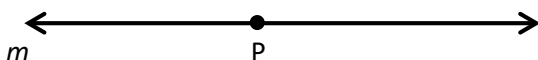
b.

J •



16. Construct the perpendicular line to line m through a given point P.

a.



b.

