

GEOMETRY

Exam 3

Based on Chapter 3 (pages 144 - 211) in your textbook.

Student's Name _____ Student Number _____

Street _____ City _____ State _____ Zip Code _____

BE SURE YOU FULLY UNDERSTAND ALL CHECKPOINT PROBLEMS FROM THIS CHAPTER BEFORE YOU COMPLETE THIS EXAM. **SHOW AS MUCH WORK AS POSSIBLE.**

Items 1-4: Think of each segment in the diagram as part of a line.

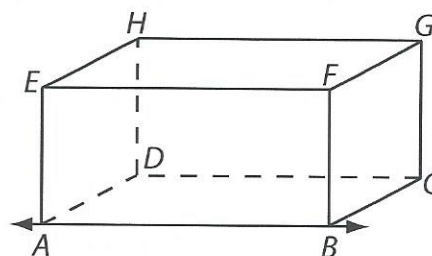
Note: All segments in the diagram meet at right angles.

1. Name a line parallel to $\overleftrightarrow{BF}$ containing point D .

2. Name a line perpendicular to $\overleftrightarrow{AB}$ containing point D .

3. Name a line skew to $\overleftrightarrow{AB}$ containing point D .

4. Name a line parallel to plane DCG .

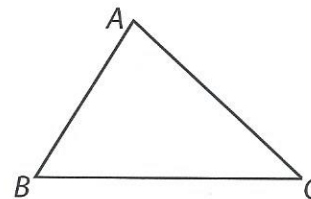


Items 5-6: Circle the correct answer and add the postulate number that justifies your answer.

5. How many lines can be drawn through A perpendicular to $\overline{BC}$?

none one infinitely many

according to postulate _____.



6. How many lines can be drawn through C parallel to $\overline{AB}$?

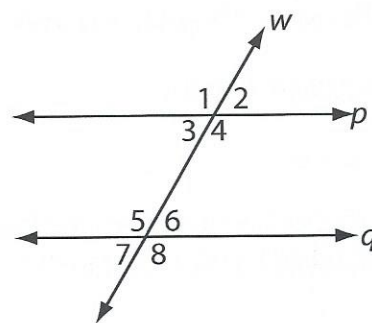
none one infinitely many

according to postulate _____.

Items 7-9: Use the diagram at right.

7. Based on the diagram to the right, complete each statement.

- $\angle 1$ and $\angle$ _____ are corresponding angles.
 $\angle 2$ and $\angle$ _____ are alternate exterior angles.
 $\angle 3$ and $\angle$ _____ are alternate interior angles.
 $\angle 5$ and $\angle$ _____ are vertical angles.
 $\angle 4$ and $\angle$ _____ are consecutive interior angles.
 Line _____ is a transversal.



8. Match the theorem or postulate that justifies each statement.

- _____ If $p \parallel q$, then $\angle 4 \cong \angle 5$.
 _____ If $p \parallel q$, then $m\angle 3 + m\angle 5 = 180^\circ$.
 _____ If $p \parallel q$, then $\angle 2 \cong \angle 6$.
 _____ If $p \parallel q$, then $\angle 1 \cong \angle 8$.
 _____ $\angle 2 \cong \angle 3$
 _____ If $\angle 3 \cong \angle 7$, then $p \parallel q$.
 _____ If $\angle 3 \cong \angle 6$, then $p \parallel q$.
 _____ If $m\angle 4 + m\angle 6 = 180^\circ$, then $p \parallel q$.
 _____ If $\angle 2 \cong \angle 7$, then $p \parallel q$.
 _____ $m\angle 1 + m\angle 2 = 180^\circ$

- A) Corresponding Angles Converse Post.
 B) Alternate Exterior Angles Thm.
 C) Consecutive Int. Ang. Converse Thm.
 D) Consecutive Interior Angles Thm.
 E) Alt. Interior Angles Converse Thm.
 F) Linear Pair Postulate
 G) Alternate Interior Angles Theorem
 H) Alt. Exterior Ang. Converse Thm.
 I) Corresponding Angles Postulate
 J) Vertical Angles Congruence Thm.

9. If $p \parallel q$ and $m\angle 1 = 125^\circ$, then $m\angle 3 =$ _____,
 $m\angle 4 =$ _____, $m\angle 5 =$ _____, and
 $m\angle 6 =$ _____.

(more)

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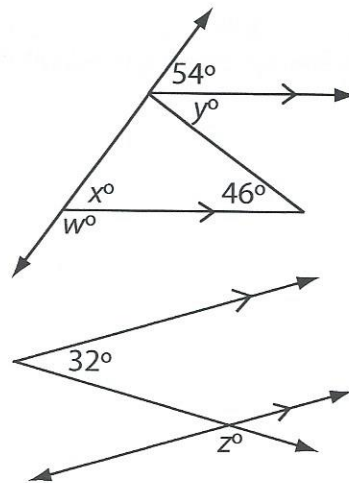
10. Find the values of w , x , y , and z .
(Feel free to mark the diagram.)

$w =$ _____

$x =$ _____

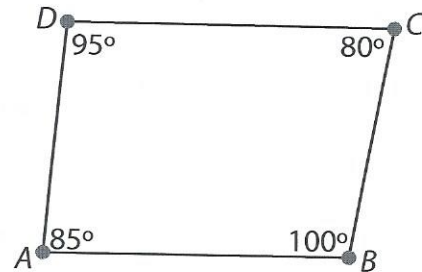
$y =$ _____

$z =$ _____

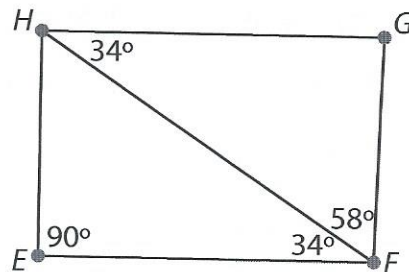


- Items 11-13: State which lines, segments, or rays are parallel in the figure to the right of each item and state the postulate or theorem which proves them parallel.

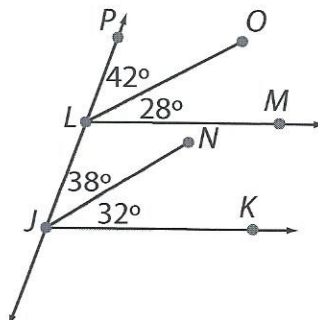
11. _____



12. _____



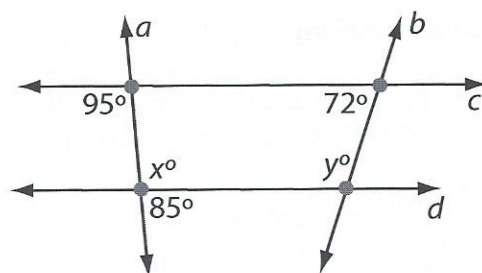
13. _____



(over)

14. Refer to the figure on the right.

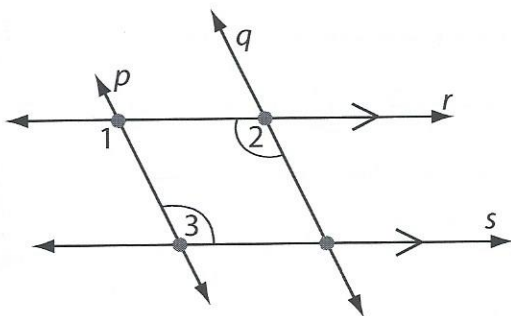
$x =$ _____, $y =$ _____
 Explain your reasoning with a paragraph proof.



15. Finish the proof given below to show that $p \parallel q$.

Given: $r \parallel s$ and $\angle 2 \cong \angle 3$

Prove: $p \parallel q$



Statements	Reasons
1. $r \parallel s$	1. Given
2. $\angle 2 \cong \angle 3$	2. _____
3. $\angle 1 \cong \angle 3$	3. _____
4. _____	4. Transitive Property of Angle Congruence
5. $p \parallel q$	5. _____

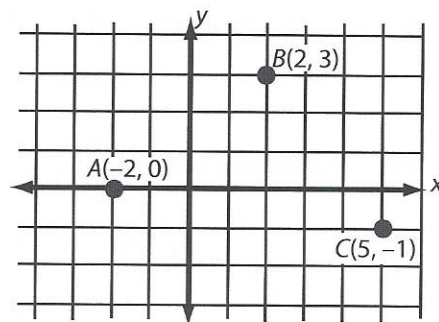
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Items 16-20: Consider points $A(-2, 0)$, $B(2, 3)$, and $C(5, -1)$.

16. Slope $\overleftrightarrow{AB}$ = _____, Slope $\overleftrightarrow{AC}$ = _____, Slope $\overleftrightarrow{BC}$ = _____.



17. Which slope in item 16 is the steepest? _____

18. Is $\triangle ABC$ a right triangle? Show why or why not.

19. Write the equation of a line through C that is parallel to $\overleftrightarrow{AB}$.

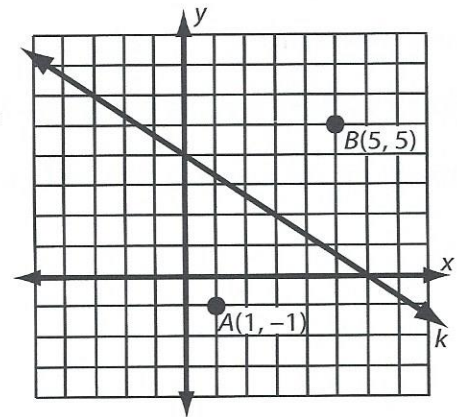
20. Write the equation of a line through B that is perpendicular to $\overleftrightarrow{AC}$.

(over)

Items 21-27: Refer to the graph on the right.

21. Line k has x -intercept _____ and y -intercept _____.

22. The slope of line k is _____.



23. Write the equation of line k in slope-intercept form ($y = mx + b$).

24. Write the equation of line k in standard form ($Ax + By = C$).

25. Draw line $\overleftrightarrow{AB}$ and prove $\overleftrightarrow{AB} \perp k$.

26. On the graph draw a line j through point A , parallel to line k .

27. Find the distance between line j and line k .
*Hint: Note the coordinates where $\overleftrightarrow{AB}$ and line k intersect.
 Find the distance between point A and the point of intersection.*

(more)

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Given: $\angle 4 \cong \angle 5$

Statements	Reasons
28. 1. _____	1. Given
29. 2. $a \perp b$	2. _____
30. 3. $\angle 2$ and $\angle 3$ are complementary	3. _____
31. 4. $m\angle 2 + m\angle 3 = 90^\circ$	4. _____

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

A diagram showing two vertical lines, labeled a and b , intersected by two horizontal lines, labeled c and d . Right angle symbols are shown at the intersections of a and c , and b and d .

Statements	Reasons

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