

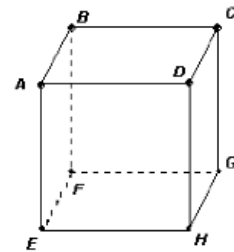
You should be able to...

- ✓ Identify parallel, perpendicular and skew lines. Identify parallel and perpendicular planes. **(Section 3.1)**
- ✓ Identify corresponding angles, alternate interior angles, consecutive interior angles, and alternate exterior angles. **(Section 3.1)**
- ✓ Find measure of angles formed by parallel lines intersected by a transversal (Corresponding Angles Postulate, Alternate Interior Angles Theorem, Alternate Exterior Angles Theorem, Consecutive Interior Angles Theorem). **(Section 3.2)**
- ✓ Prove lines are parallel (Corresponding Angles Converse, Alternate Interior Angles Converse, Alternate Exterior Angles Converse, Consecutive Interior Angles Converse) **(Section 3.3)**

Practice Problems

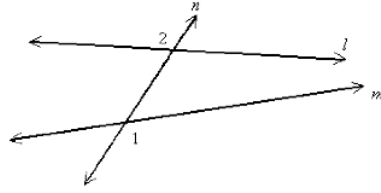
1. Two lines that are not coplanar and do not intersect are called _____.
- a. Parallel b. Perpendicular c. Skew d. None of the above

Use the diagram of the cube to the right for questions #2 – 4 below.



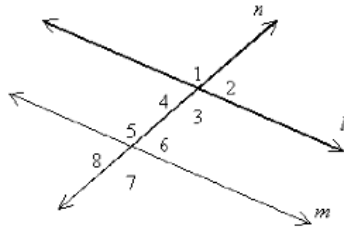
2. \overleftrightarrow{AD} and \overleftrightarrow{HG} are _____.
- a. Parallel lines b. Perpendicular Lines c. Skew Lines d. None
3. \overleftrightarrow{BC} and \overleftrightarrow{AB} are _____.
- a. Parallel lines b. Perpendicular Lines c. Skew Lines d. None
4. \overleftrightarrow{FB} and \overleftrightarrow{GC} are _____.
- a. Parallel lines b. Perpendicular Lines c. Skew Lines d. None

5. In the figure below, $\angle 1$ and $\angle 2$ are _____.



- a. Alternate exterior angles
- b. Alternate interior angles
- c. Consecutive interior angles
- d. Corresponding angles

Use the following figure to answer questions 6 – 7.



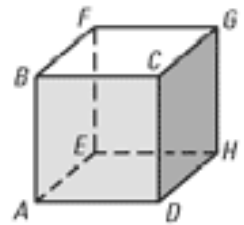
6. In the figure above, $\angle 6$ and $\angle 3$ are _____.

- a. Alternate exterior angles
- b. Consecutive interior angles
- c. Corresponding angles
- d. Alternate interior angles

7. In the figure above, $\angle 6$ and $\angle 2$ are _____.

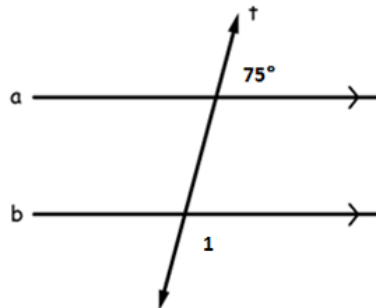
- a. Alternate interior angles
- b. Consecutive interior angles
- c. Alternate exterior angles
- d. Corresponding angles

8. Using the diagram below, name **FOUR** pairs of perpendicular lines in the figure.



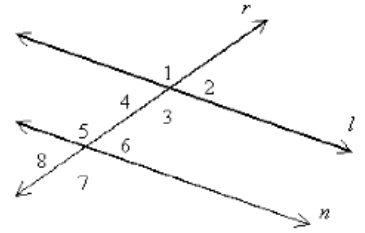
9. Find $m\angle 1$ in the figure below given that $\overrightarrow{PQ} \parallel \overrightarrow{RS}$.

- a. 105°
- b. 75°
- c. 115°
- d. 15°



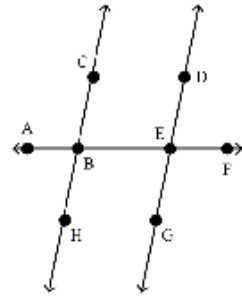
10. In the figure below, $l \parallel n$ and r is a transversal. Which of the following is **not** necessarily true?

- a. $\angle 8 \cong \angle 2$
- b. $\angle 2 \cong \angle 6$
- c. $\angle 5 \cong \angle 3$
- d. $\angle 4 \cong \angle 7$



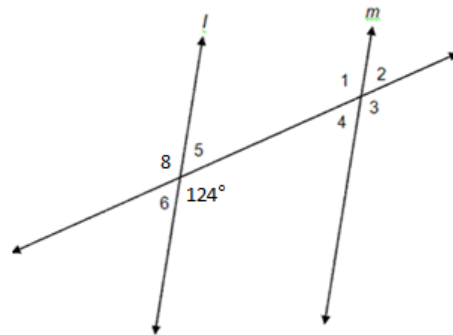
11. In the figure shown, $\overline{HC} \parallel \overline{GD}$ and $m\angle ABC = 100^\circ$. Which of the following statements is false?

- a. $m\angle CBE = 80^\circ$
- b. $m\angle DEF = 80^\circ$
- c. $\angle DEB$ and $\angle CBE$ are corresponding angles
- d. $\angle CBE$ and $\angle GEB$ are alternate interior angles

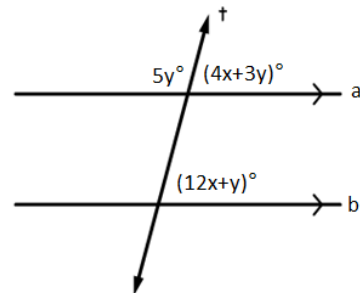


12. Use the figure to find the measure of $\angle 3$.

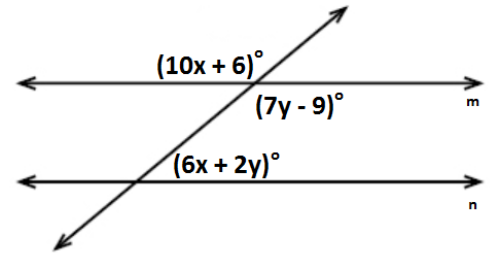
- a. 124°
- b. 56°
- c. 79°
- d. 146°



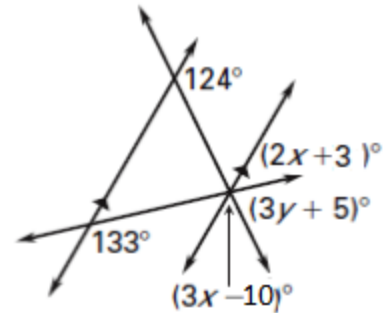
13. Please find the values of x and y . Justify each step using the appropriate theorem/postulate.



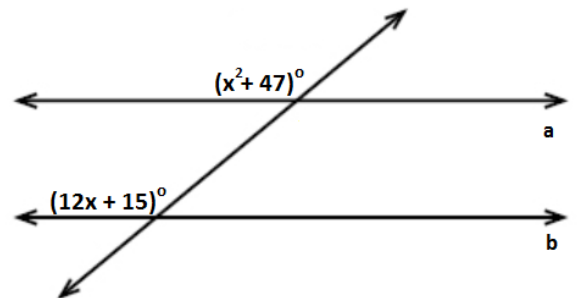
14. Given $m \parallel n$, please find the values of x and y . Justify each step using the appropriate theorem/postulate.



15. Given the diagram below, please solve for x and y .

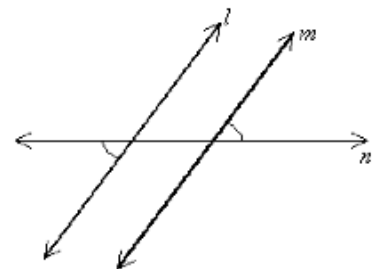


16. Please find the value of x that will make $a \parallel b$. Please justify your reasoning.

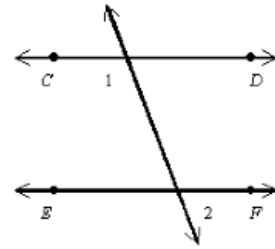


17. Using the figure below, which theorem guarantees l and m are parallel?

- Alternate Interior Angles Converse
- Consecutive Interior Angles Converse
- Corresponding Angles Converse
- Alternate Exterior Angles Converse

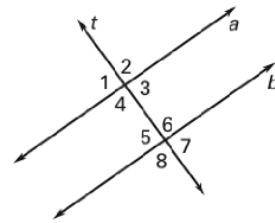


18. Find the value of x that will allow you to prove that $\overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$ if $m\angle 1 = (3x + 30)^\circ$ and $m\angle 2 = 81^\circ$.
State which theorem or postulate you used for each step.



Use the following given angle measures to decide whether lines a and b are parallel. Explain.

19. $m\angle 3 = 96^\circ$, $m\angle 5 = 84^\circ$



20. $m\angle 5 = 79^\circ$, $m\angle 4 = 79^\circ$

21. $m\angle 2 = 81^\circ$, $m\angle 6 = 81^\circ$

True or False:

22. If two parallel lines are intersected by a transversal, then alternate exterior angles have measures of 90 degrees.
23. If two parallel lines are intersected by a transversal, then consecutive interior angles are supplementary.
24. If two lines are intersected by a transversal and alternate interior angles are equal in measure, then the lines are parallel.
25. If two lines are intersected by a transversal and corresponding angles are supplementary, then the lines are parallel.

Answer Key :

1. C
2. C
3. B
4. A
5. A
6. B
7. D

8. Sample answer: \overrightarrow{AB} and \overrightarrow{BC} , \overrightarrow{AB} and \overrightarrow{AD} , \overrightarrow{FG} and \overrightarrow{GH} , \overrightarrow{GH} and \overrightarrow{DH}

9. A
10. D
11. C
12. A

13. $x = 5$, $y = 20$

Sample answer : $4x + 3y = 12x + y$ Corresponding Angles Postulate

$5y + 4x + 3y = 180$ Linear Pair Postulate

14. $x = 9$, $y = 15$

Sample answer: $10x + 6 = 7y - 9$ Vertical Angles Theorem

$7y - 9 + 6x + 2y = 180$ Consecutive Interior Angles Theorem

15. $x = 22$, $y = 24$

16. $x = 4$ or $x = 8$, Corresponding Angles Converse

17. D

18. The angle next to $\angle 1$ is also 81° because of corresponding angles.

$\angle 1 + 81 = 180$ because they make a linear pair (are supplementary)

$3x + 30 + 81 = 180$ by substitution

$x = 23$

19. Line a and line b are not parallel.

In order to be parallel, $\angle 3 \cong \angle 5$ by the alternate interior angles converse

20. Line a and line b are not parallel.

In order to be parallel, $m\angle 4 + m\angle 5 = 180$ by the consecutive interior angles converse

21. Line a and line b are parallel because $\angle 2 \cong \angle 6$ by the corresponding angles converse

22. False – Alternate exterior angles have to have the same measure

23. True – By the consecutive interior angles theorem

24. True – By the alternate interior angles converse

25. False – Corresponding angles must have the same measure