

Geometry · Parallel Lines, Transversals and Proofs · Test Answer Key

Common Core G-CO.C.9 · mathovore.fr

This answer key shows a complete solution and a scoring guide for each question of the parallel lines and transversals test. Award partial credit using the point breakdown listed after each solution.

GeometryCommon Core: G-CO.C.9

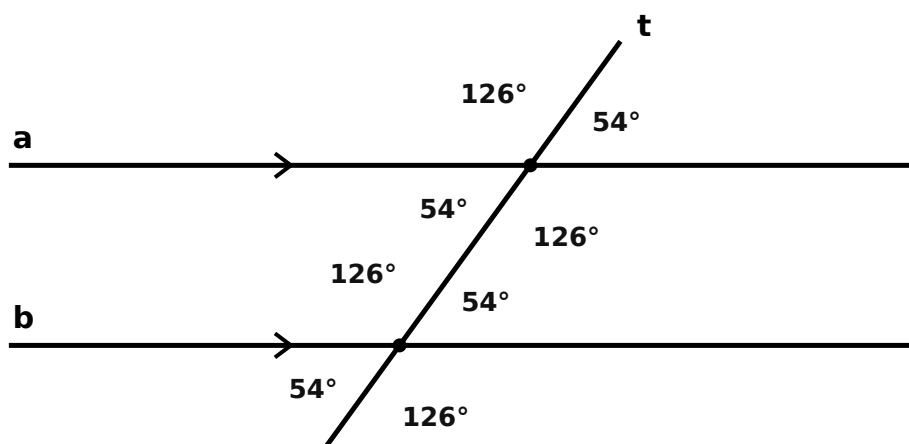
Question 1: Name the angle pairs (2 points)

- a. $\angle 4$ and $\angle 6$ are between the lines on the same side of the transversal: **same-side interior angles**.
- b. $\angle 1$ and $\angle 8$ are outside the lines on opposite sides: **alternate exterior angles**.

Scoring: 1 point for each correct name.

Question 2: Find missing angles (2 points)

- a. $m\angle 6 = 54^\circ$ (alternate interior angles are equal).
- b. $m\angle 5 = 180 - 54 = 126$ (same-side interior angles are supplementary). $m\angle 8 = 126^\circ$ because $\angle 8$ and $\angle 5$ are vertical angles. Both are 126° .



All eight measures.

Scoring: 1 point for part (a). 1 point for part (b): 0.5 for each angle.

Question 3: Corresponding angles and x (2 points)

Corresponding angles are equal: $7x - 9 = 4x + 24$. Then $3x = 33$, so $x = 11$.

$7(11) - 9 = 68$ and $4(11) + 24 = 68$. Each angle is 68° .

Scoring: 1 point for the correct equation, 1 point for $x = 11$ and both angle measures.

Question 4: Same-side interior angles and x (2 points)

Same-side interior angles are supplementary: $(3x + 12) + (5x - 8) = 180$. Then $8x + 4 = 180$ and $8x = 176$, so $x = 22$.

$3(22) + 12 = 78$ and $5(22) - 8 = 102$. The angles are 78° and 102° .

Scoring: 1 point for the correct equation and $x = 22$, 1 point for both angle measures.

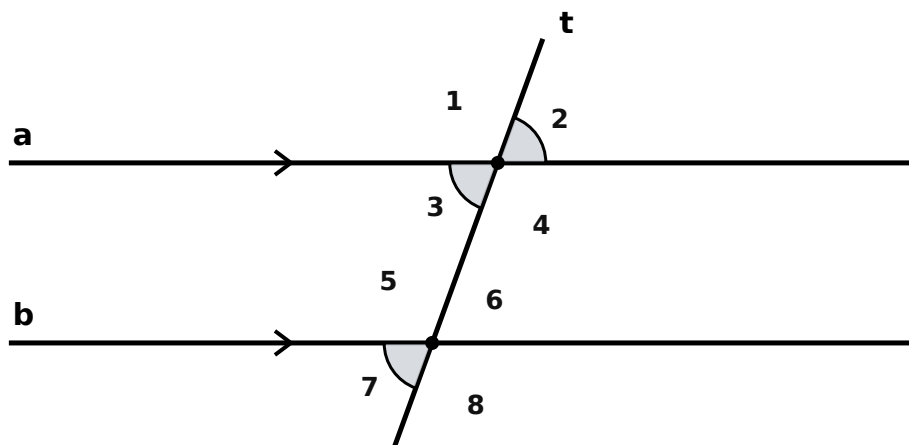
Question 5: Decide if lines are parallel (2 points)

- a. **Yes.** The alternate interior angles are equal, so $a \parallel b$ by the Alternate Interior Angles Converse.
- b. **No.** $100 + 70 = 170$, which is not 180° , so the same-side interior angles are not supplementary.

Scoring: 1 point per part: 0.5 for the decision and 0.5 for the reason.

Question 6: Proof that lines are parallel (3 points)

Statements	Reasons
$m\angle 2 = m\angle 7$	Given
$m\angle 2 = m\angle 3$	Vertical Angles Theorem
$m\angle 3 = m\angle 7$	Substitution Property of Equality
$a \parallel b$	Corresponding Angles Converse

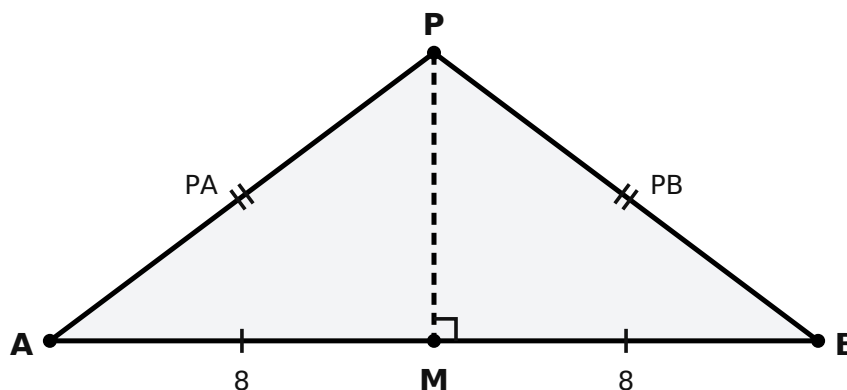


Angles 2 and 3 are vertical; angles 3 and 7 are corresponding.

Scoring: 1 point for $m\angle 2 = m\angle 3$ with its reason, 1 point for $m\angle 3 = m\angle 7$, 1 point for the conclusion with the correct converse. Other valid chains also earn full credit.

Question 7: Perpendicular Bisector Theorem proof (3 points)

Statements	Reasons
$AM = BM$	Definition of bisector (M is the midpoint)
$m\angle PMA = m\angle PMB = 90^\circ$	Definition of perpendicular lines
$PM = PM$	Reflexive Property
$\triangle PMA$ is congruent to $\triangle PMB$	SAS (two sides and the included angle)
$PA = PB$	Corresponding parts of congruent triangles are congruent



Tick marks show equal sides.

Scoring: 1 point for the two equal sides and the equal right angles, 1 point for triangle congruence by SAS, 1 point for the conclusion with the CPCTC reason.

Question 8: Equidistant point (2 points)

$PA = PB$, so $4x - 3 = 2x + 13$. Then $2x = 16$, so $x = 8$.

$PA = 4(8) - 3 = 29$ (and $PB = 2(8) + 13 = 29$).

Scoring: 1 point for the equation and $x = 8$, 1 point for $PA = 29$.

Question 9: Parallel avenues (2 points)

The angles are alternate exterior angles, so they are equal: $2x + 15 = 3x - 10$. Then $x = 25$.

Each angle is $2(25) + 15 = 65$ degrees. The northwest angle at Cedar forms a linear pair with the northeast angle: $180 - 65 = 115$. It measures 115° .

Scoring: 1 point for $x = 25$ with the correct equation, 1 point for 115° .

Total
20 points