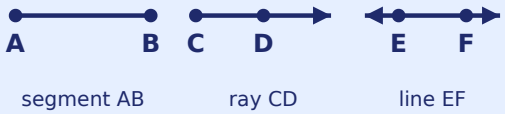
Unit 1 · Foundations of Geometry Cheat Sheet

Unit 1 focus: points, lines, planes, segments, rays and angles

1 KEY VOCABULARY

point	An exact location; no size.	A
line	Straight path extending forever both ways.	$\overleftrightarrow{AB}$
plane	A flat surface extending forever.	plane $\mathcal{P}$
segment	Part of a line with two endpoints.	$\overline{AB}$
ray	Part of a line with one endpoint.	$\overrightarrow{AB}$
angle	Two rays with a common endpoint (vertex).	$\angle ABC$

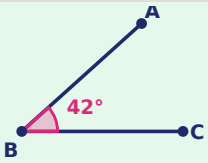
2 NAMING FIGURES



- Ray order matters: $\overrightarrow{CD}$ starts at C; $\overrightarrow{DC}$ starts at D.
- Name an angle with the vertex in the middle: $\angle ABC = \angle CBA$.
- **Collinear**: on one line. **Coplanar**: in one plane.

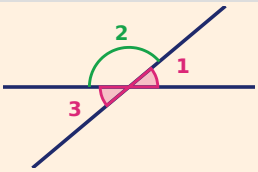
3 CLASSIFYING ANGLES

Type	Measure
acute	$0^\circ < m\angle < 90^\circ$
right	$m\angle = 90^\circ$ (box symbol)
obtuse	$90^\circ < m\angle < 180^\circ$
straight	$m\angle = 180^\circ$



4 ANGLE PAIRS

Pair	Rule
complementary	add to 90°: $60^\circ + 30^\circ$
supplementary	add to 180°: $110^\circ + 70^\circ$
vertical angles	opposite angles at an intersection are equal
linear pair	adjacent and supplementary



5 ALGEBRA WITH ANGLES

Set up the equation from the relationship, solve, then find each angle.

Example: $(x + 15)^\circ$ and $(2x - 3)^\circ$ are supplementary.
Equation: $3x + 12 = 180,\ x = 56$
Angles: 71° and 109°

Answer: 71° **and** 109°

6 QUICK REMINDERS & COMMON MISTAKES

✔ Do remember

- Use degree symbols with angle measures.
- Vertical angles are congruent (equal).
- Mark congruent parts with matching ticks and arcs.

✘ Common mistakes

- Ray AB = ray BA: the endpoint comes first
- Vertical angles add to 180°: they are equal
- Complementary vs supplementary: 90° vs 180°

Unit 1 · Foundations of Geometry Cheat Sheet

More practice: segment and angle addition, midpoints, distance and angle pairs

1 SEGMENT ADDITION

If B is between A and C, then $AB + BC = AC$.

Example: $AB = 8$ and $BC = 11$
Add: $AC = 8 + 11$
Answer: $AC = 19$



2 MIDPOINT

The midpoint splits a segment into two congruent halves. On a grid: $M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.

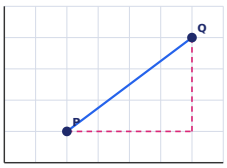
Example: Midpoint of $(2, 1)$ and $(6, 9)$
Average: $\left(\frac{8}{2}, \frac{10}{2}\right)$
Answer: $(4, 5)$



3 DISTANCE FORMULA

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ (the Pythagorean Theorem on a grid).

Example: $P(2, 1)$ to $Q(6, 4)$
Substitute: $\sqrt{4^2 + 3^2} = \sqrt{25}$
Answer: 5 units



4 ANGLE ADDITION

If ray BD is inside $\angle ABC$: $m\angle ABD + m\angle DBC = m\angle ABC$.

Example: $m\angle ABD = 34°$, $m\angle DBC = 56°$
Add: $34° + 56°$
Answer: $m\angle ABC = 90°$

5 BISECTORS

- A **segment bisector** passes through the midpoint.
- An **angle bisector** splits an angle into two congruent angles.
- If ray BD bisects $\angle ABC = 80°$, each half is $40°$.
- **Perpendicular** lines meet at $90°$: $\perp$.

6 CHECK YOURSELF

- Did I put the vertex letter in the middle?
- Do my parts add up to the whole (segment or angle addition)?
- Complementary → 90°, supplementary → 180°, vertical → equal.
- Is my diagram labeled with given lengths and angles?