

Geometry · Points, Lines, Planes, Segments and Angles · Worksheet

Common Core G-CO.A.1 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

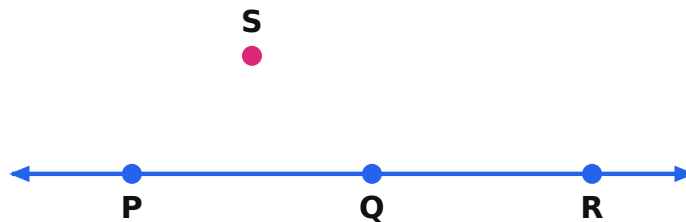
These 23 problems practice the precise definitions of geometry (G-CO.A.1). Students name points and rays, use the Segment Addition and Angle Addition Postulates, work with midpoints and bisectors, and solve for unknowns in complementary, supplementary, linear and vertical angle pairs.

The problems go from naming and definitions to algebra and word problems about a highway, a ladder and a laptop. Draw each figure before solving.

GeometryCommon Core: G-CO.A.1

Problem 1: Naming points and rays

Use the figure for the following.



Points P, Q and R lie on one line. Point S does not.

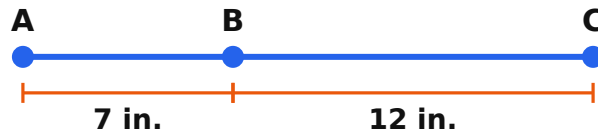
- Name three collinear points.
- Name three noncollinear points.
- Name the ray with endpoint Q that passes through R.

Problem 2: Defining a segment

Write a precise definition of a line segment using the undefined terms point and line.

Problem 3: Segment addition: find the whole

Point B is between A and C on a straight board. Find AC.



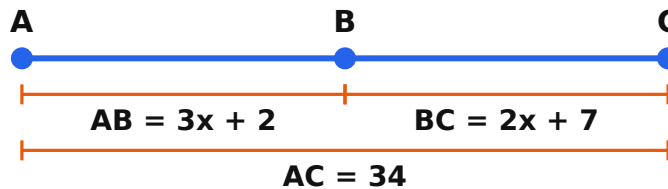
$AB = 7$ in. and $BC = 12$ in.

Problem 4: Segment addition: find a part

Point B is between A and C. $AC = 31$ cm and $AB = 18$ cm. Find BC.

Problem 5: Segment addition with algebra

Point B is between A and C, with $AB = 3x + 2$, $BC = 2x + 7$ and $AC = 34$. Find x, AB and BC.



B is between A and C.

Problem 6: Midpoint with algebra

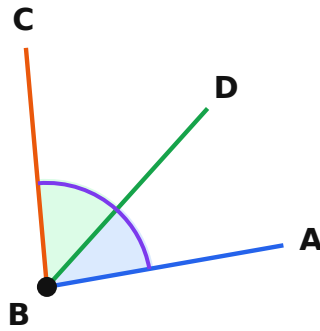
M is the midpoint of $\overline{PQ}$, with $PM = 4x - 3$ and $MQ = 2x + 9$. Find x and PQ.

Problem 7: Midpoint on a number line

Point A is at -4 and point B is at 10 on a number line. Find AB and the coordinate of the midpoint of $\overline{AB}$.

Problem 8: Angle addition: find the whole

Ray BD lies inside $\angle ABC$. Find $m\angle ABC$.



The two smaller angles measure 38° and 47° .

Problem 9: Angle addition: find a part

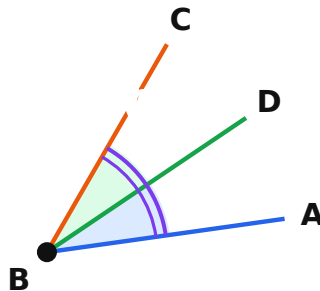
Ray OB lies inside $\angle AOC$. $m\angle AOC = 112^\circ$ and $m\angle AOB = 65^\circ$. Find $m\angle BOC$.

Problem 10: Angle addition with algebra

Ray QS lies inside $\angle PQR$. $m\angle PQR = 96^\circ$, $m\angle PQS = (4x+8)^\circ$ and $m\angle SQR = (2x+4)^\circ$. Find x , $m\angle PQS$ and $m\angle SQR$.

Problem 11: Angle bisector

Ray BD bisects $\angle ABC$. $m\angle ABD = (3x+5)^\circ$ and $m\angle DBC = (5x-9)^\circ$. Find x and $m\angle ABC$.



Ray BD bisects angle ABC.

Problem 12: Complement of an angle

Find the complement of an angle that measures 63° .

Problem 13: Supplement of an angle

Find the supplement of an angle that measures 127° .

Problem 14: Complementary angles with algebra

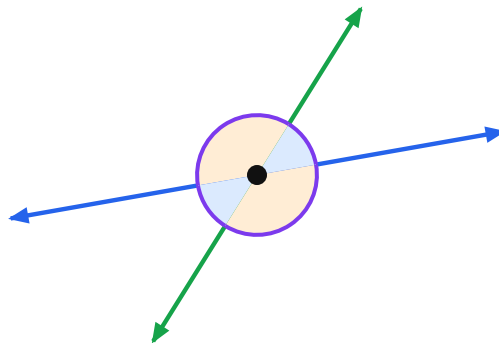
Two angles are complementary. Their measures are $(2x+3)^\circ$ and $(3x+7)^\circ$. Find x and both angle measures.

Problem 15: Supplementary angles with algebra

Two angles are supplementary. Their measures are $(4x-10)^\circ$ and $(6x+20)^\circ$. Find x and both angle measures.

Problem 16: Angles at an intersection

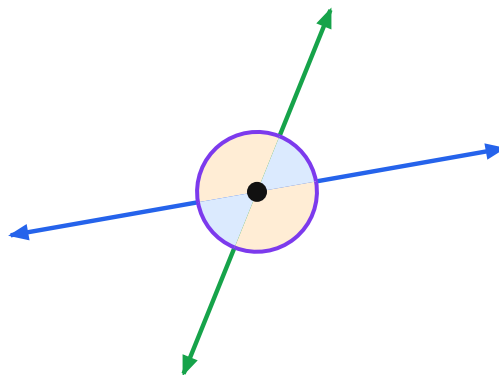
Two lines intersect. One of the four angles measures 48° . Find the measures of angles a , b and c .



Angle a is next to the 48° angle; angle b is opposite it.

Problem 17: Vertical angles with algebra

Angles 1 and 3 are vertical angles. $m\angle 1 = (7x-12)^\circ$ and $m\angle 3 = (4x+18)^\circ$. Find x , $m\angle 1$ and $m\angle 2$.



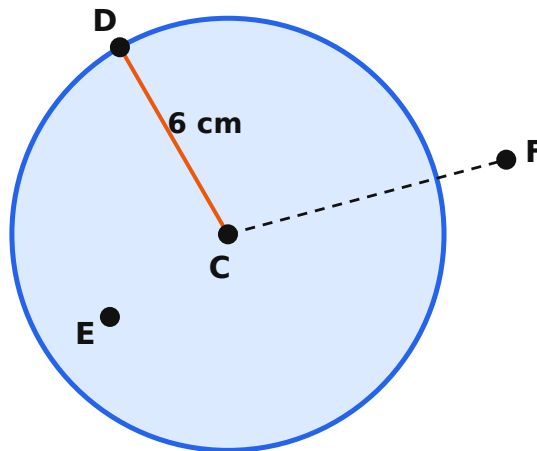
Angles 1 and 3 are opposite each other.

Problem 18: Perpendicular lines

Lines s and t are perpendicular. One of the angles they form measures $(3x+6)^\circ$. Find x .

Problem 19: Points and a circle

A circle has center C and radius 6 cm. Point D is 6 cm from C , point E is 4 cm from C and point F is 8 cm from C , all in the same plane. Which points are on the circle?



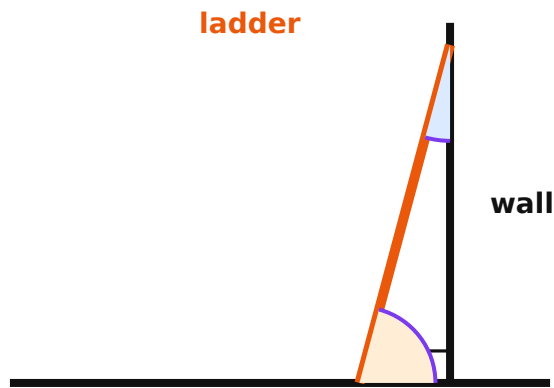
Distances from the center: D is 6 cm, E is 4 cm, F is 8 cm.

Problem 20: Road trip on a straight highway

A diner is at mile marker 18 and a motel is at mile marker 74 on a straight highway. Jamal wants a rest stop at the midpoint between them. Find the distance between the diner and the motel, and the mile marker of the rest stop.

Problem 21: Ladder against a wall

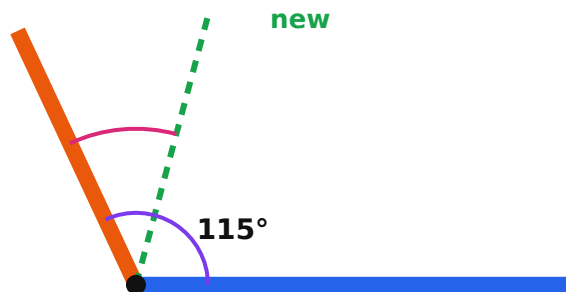
A ladder leans against a vertical wall on level ground. It makes a 75° angle with the ground. Find the angle between the ladder and the wall.



The wall is perpendicular to the ground.

Problem 22: Laptop lid

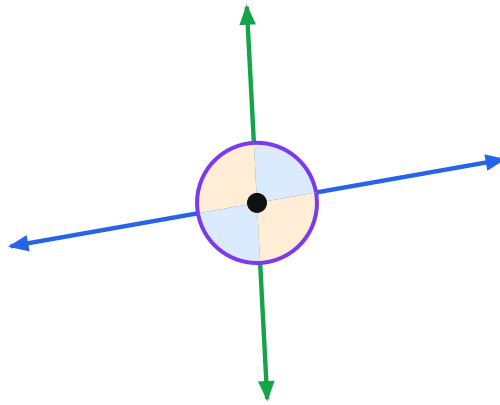
Maya opens her laptop so the lid makes a 115° angle with the keyboard. She lowers the lid by 40° . Find the new angle between the lid and the keyboard.



The dashed lid shows the lowered position.

Problem 23: Four angles at an intersection

Two lines intersect to form angles 1, 2, 3 and 4 in order around the point. Angles 1 and 2 form a linear pair, with $m\angle 1 = (2x + 15)^\circ$ and $m\angle 2 = (3x - 5)^\circ$. Find x and the measures of all four angles.



Angles 1 and 2 are a linear pair.