LESSON MAKER PRO

Lines, Angles, Circles

Use precise definitions and distances to describe geometric figures.

HIGH SCHOOL · HSG-CO.A.1

CCSS.Math.Content.HSG-CO.A.1 "Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc."

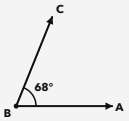
NAME _____ DATE _____

DEFINITION TOOLS

A line has no endpoints, and a line segment is part of a line with two endpoints. An angle is made by two rays sharing one endpoint. A circle is all points in a plane the same distance from a center, while an arc is part of the circle. In one plane, parallel lines never meet, and perpendicular lines meet to make right angles.

WORKED EXAMPLE

Use the marked angle. Find its supplement.

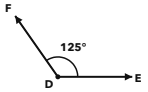


1. Read the marked angle: m∠ABC = 68°.
2. Supplementary angles have a total measure of 180°.
3. Subtract: 180° - 68° = 112°.

Answer: 112°

PRACTICE 6 problems

1 Classify the angle shown as acute, right, obtuse, or straight.



ANSWER _____

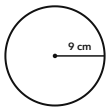
2 Points J, K, and L are on the same line, and K is between J and L. JK = 11 cm and KL = 17 cm. Find JL.

ANSWER _____

3 Two lines p and q intersect. One angle at the intersection measures (5x + 10)°, where x = 16. Are p and q perpendicular? Explain.

ANSWER _____

4 Use the circle shown. Find its diameter.



ANSWER _____

5 A circular track has a circumference of 44 m. A runner travels along a 1/4-circle arc. How far does the runner travel?

ANSWER _____

6 Line r passes through (0, 2) and (3, 8). Line s passes through (1, -1) and (4, 5). Are the distinct lines parallel? Show a slope comparison.

ANSWER _____

APPLY IT Show your work

1 Kai is making a circular sticker for a laptop. The sticker's circumference is 48 cm. Kai places a design along one quarter of the sticker's edge. What length of the edge does the design cover?

WORK SPACE

ANSWER _____

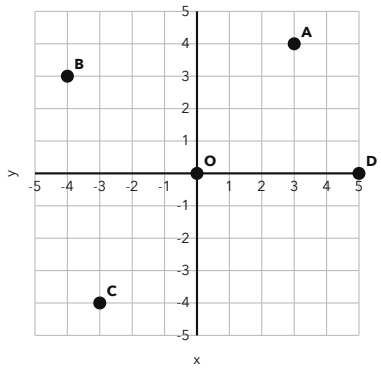
2 In a video game level, two straight laser paths lie on the same flat map. They cross, and one angle where they cross is 90°. What is the relationship between the two paths?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use the coordinate grid. Can one circle centered at O pass through A, B, C, and D? Explain using the distances from O.



WORK SPACE AND ANSWER

ANSWER KEY

Lines, Angles, Circles

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Classify the angle shown as acute, right, obtuse, or straight.	**obtuse angle**
2	Points J, K, and L are on the same line, and K is between J and L. JK = 11 cm and KL = 17 cm. Find JL.	**28 cm**
3	Two lines p and q intersect. One angle at the intersection measures (5x + 10)°, where x = 16. Are p and q perpendicular? Explain.	**Yes. (5 · 16 + 10)° = 90°, so the lines intersect to form a right angle.**
4	Use the circle shown. Find its diameter.	**18 cm**
5	A circular track has a circumference of 44 m. A runner travels along a 1/4-circle arc. How far does the runner travel?	**11 m**
6	Line r passes through (0, 2) and (3, 8). Line s passes through (1, -1) and (4, 5). Are the distinct lines parallel? Show a slope comparison.	**Yes. The slope of r is 2, and the slope of s is 2, so the distinct lines are parallel.**

PART 2 · APPLY IT

1. **12 cm** One quarter of the distance around the circle is 48/4 = 12 cm.
2. **The paths are perpendicular lines.** Lines that intersect to form a right angle are perpendicular.

CHALLENGE

Yes. OA = OB = OC = OD = 5 units, so all four points are the same distance from O and lie on a circle centered at O with radius 5 units.

Accept equivalent slope work in problem 6, such as 6/3 for both lines. For the challenge, require the idea that every point on a circle is the same distance from its center.