

ANSWER MAZE



MEASURING AND CLASSIFYING ANGLES

One Protractor, Eight Angles

One page · 10–15 minutes · nothing to prepare

FREE

1

$m\angle BOD = ?$

$70^\circ \rightarrow$ you are out

$105^\circ \rightarrow$ go to 3

Where does each arm cross the scale? Read both on the same scale.

2

$m\angle COE = ?$

$80^\circ \rightarrow$ go to 8

$110^\circ \rightarrow$ go to 3

Which arm is nearer a 0? Use that scale for both readings.

3

$m\angle BOC = ?$

$35^\circ \rightarrow$ go to 2

$70^\circ \rightarrow$ go to 7

Is either arm on a 0? Look at where each of the two arms crosses the scale.

4

$m\angle AOD = ?$

$75^\circ \rightarrow$ go to 6

$105^\circ \rightarrow$ go to 5

Estimate first: more or less than a square corner?

1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** *“If one arm is on 0, read the other arm on the scale that starts there. If neither arm is on 0, read both arms on one scale and subtract. Estimate first, every time.”*
3. **Start at box 4.** After six boxes, you are out. **Write every box number in the row at the foot as you go.**

Student sheet	page 3, one per student. The protractor is printed once, at the top.
Answers	page 4.

One drawing, eight questions. The protractor at the top has six rays coming out of its center O. *OA* and *OF* lie along the flat edge, on the two zeros. The other rays cross the scale. Every box asks for the angle between two of these rays.

The route is 4 → 5 → 7 → 2 → 8 → 1 → out. Boxes 3 and 6 are not on it. **They look like every other box.** Both of their answers lead back onto the route.

The two boxes off the route catch the two common protractor mistakes. Two boxes send a wrong answer to box 6. In those boxes one arm is on a zero, but the student read the other scale. Four boxes send a wrong answer to box 3. In those boxes neither arm is on a zero, and the student read only the far arm instead of subtracting. The number just before 3 or 6 in a student's row is the box they got wrong. Which of the two boxes it is tells you which mistake they made.

What the row at the foot tells you. A clean run is **six numbers**. A longer row went wrong somewhere.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.

chooseyourlesson.com — 135 free geometry lessons.

Answer Maze

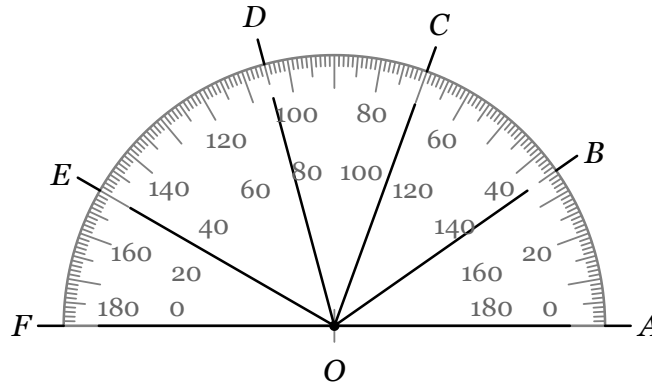
Start at box 4 · every angle is on this one protractor

Name _____

Period _____

Date _____

Every box asks for an angle at O . If one arm is on o , read the other arm on the scale that starts there. If neither arm is on o , read both arms on one scale and subtract. First decide if the angle is more or less than a square corner.



$m\angle BOD = ?$

1

$70^\circ \rightarrow$ you are out
 $105^\circ \rightarrow$ go to 3

Where does each arm cross the scale? Read both on the same scale.

$m\angle COE = ?$

2

$80^\circ \rightarrow$ go to 8
 $110^\circ \rightarrow$ go to 3

Which arm is nearer a o ? Use that scale for both readings.

$m\angle BOC = ?$

3

$35^\circ \rightarrow$ go to 2
 $70^\circ \rightarrow$ go to 7

Is either arm on o ? Look at where each of the two arms crosses the scale.

$m\angle AOD = ?$

4

$75^\circ \rightarrow$ go to 6
 $105^\circ \rightarrow$ go to 5

Estimate first: more or less than a square corner?

$m\angle EOF = ?$

5

$30^\circ \rightarrow$ go to 7
 $150^\circ \rightarrow$ go to 6

Is the o you count from under the flat arm?

$m\angle COF = ?$

6

$70^\circ \rightarrow$ go to 4
 $110^\circ \rightarrow$ go to 5

Two numbers sit at the arm. Which o is the flat arm on?

$m\angle BOE = ?$

7

$145^\circ \rightarrow$ go to 3
 $115^\circ \rightarrow$ go to 2

Find where each arm crosses. Is the opening wider than a square corner?

$m\angle DOE = ?$

8

$75^\circ \rightarrow$ go to 3
 $45^\circ \rightarrow$ go to 1

Is either arm on o ? Look at both arms before you read.

Write every box number here as you go. A clean run is six numbers.

--	--	--	--	--	--	--	--	--	--



chooseyourlesson.com
135 free geometry lessons.

Answer Maze — answers

For the teacher

This is the route, in order. Boxes 3 and 6 are not on it. They come last in the table. A student reaches them only with a wrong answer. Each arm's reading is given on the outer scale, then on the inner scale.

4 → 5 → 7 → 2 → 8 → 1 → out

	Box	Angle asked	The two arms read (outer / inner)	Answer	Wrong answer, and where it goes	Right answer goes to
1	Box 4	$m\angle AOD$	OA: 0 / 180; OD: 105 / 75	105°	75° (read the other scale) → box 6	box 5
2	Box 5	$m\angle EOF$	OE: 150 / 30; OF: 180 / 0	30°	150° (read the other scale) → box 6	box 7
3	Box 7	$m\angle BOE$	OB: 35 / 145; OE: 150 / 30	115°	145° (read one arm and did not subtract) → box 3	box 2
4	Box 2	$m\angle COE$	OC: 70 / 110; OE: 150 / 30	80°	110° (read one arm and did not subtract) → box 3	box 8
5	Box 8	$m\angle DOE$	OD: 105 / 75; OE: 150 / 30	45°	75° (read one arm and did not subtract) → box 3	box 1
6	Box 1	$m\angle BOD$	OB: 35 / 145; OD: 105 / 75	70°	105° (read one arm and did not subtract) → box 3	out
	Box 3	$m\angle BOC$	OB: 35 / 145; OC: 70 / 110	35°	70° (read one arm and did not subtract) → box 7	box 2
	Box 6	$m\angle COF$	OC: 70 / 110; OF: 180 / 0	110°	70° (read the other scale) → box 4	box 5

Every wrong answer comes from one of the two mistakes, not from an arithmetic slip. Three checks are worth saying aloud. Estimate first. The difference of two readings is always smaller than either reading of the far arm. If an angle is smaller than a square corner but the reading is over 90, the student read the other scale.

Guessing does not get a student out. Every simple guessing rule, such as always taking the first answer, goes wrong within the first two boxes.

One shortcut does work. A student can trace the arrows backwards from “you are out” and find the route without measuring any angle. Such a student has written the row of box numbers but has not found a single angle.