

ANSWER MAZE



ANGLE ADDITION AND ANGLE BISECTORS

Part, Half or Whole?

Angle addition & bisectors · one page · 10–15 minutes · nothing to prepare

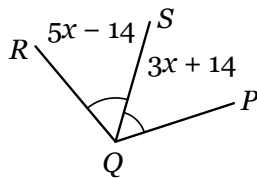
FREE

1

Ray QS bisects $\angle PQR$. Find $m\angle PQR$.

$112^\circ \rightarrow$ go to 8
 $56^\circ \rightarrow$ go to 7

Circle what the box asks for: x , a half, or the whole.

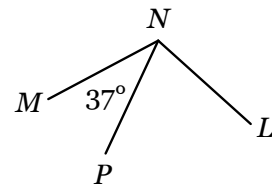


2

$m\angle MNL = 110^\circ$. Find $m\angle PNL$.

$147^\circ \rightarrow$ go to 3
 $73^\circ \rightarrow$ go to 6

Is the angle asked for a part, or the whole?

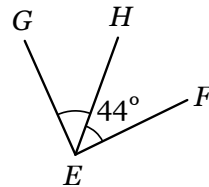


3

Ray EH bisects $\angle FEG$. Find $m\angle FEG$.

$22^\circ \rightarrow$ go to 5
 $88^\circ \rightarrow$ go to 1

Is the printed angle a half, or the whole?

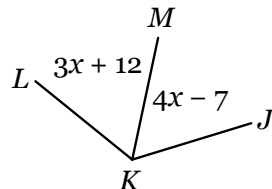


4

$m\angle JKL = 124^\circ$. Find $m\angle MKL$.

$63^\circ \rightarrow$ go to 2
 $17^\circ \rightarrow$ go to 7

Put x back into the part the box names.



1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** *“Before you find anything, circle what each box asks for: a part, a half, or the whole. The two parts add up to the whole. A bisector makes two equal halves.”*
3. **Start at box 5.** Six boxes and you are out. **Write every box number in the row at the foot as you go.**

Student sheet	page 3, one per student. A ray inside an angle, a bisected angle and two angles sharing only a vertex are printed on it as pictures.
Answers	page 4.

The route is 5 → 1 → 8 → 4 → 2 → 6 → out. Boxes 3 and 7 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 two kinds of mistake. Three boxes send a wrong answer to box 3. In those boxes the student did the opposite operation. The student doubled when the box asked for a half, used a half as if it were the whole angle, or added a part to the whole. Three boxes send a wrong answer to box 7. In those boxes the student stopped at a number that was not asked for: the value of x , or one half when the whole angle was asked for. The number just before 3 or 7 in a student's row is the box they got wrong.

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.

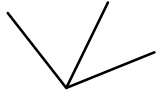
Answer Maze

Start at box 5 · circle what is asked for

Name _____

Period _____

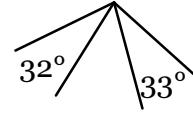
Date _____



A ray inside the angle
part + part = whole



Matching arcs: the bisector
half = half · whole = 2 × half



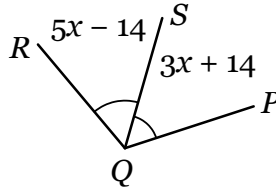
Share only the vertex
no equation, a part is missing

1

Ray QS bisects $\angle PQR$.
Find $m\angle PQR$.

$112^\circ \rightarrow$ go to 8
 $56^\circ \rightarrow$ go to 7

Circle what the box asks for:
 x , a half, or the whole.

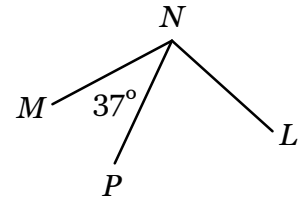


2

$m\angle MNL = 110^\circ$. **Find $m\angle PNL$.**

$147^\circ \rightarrow$ go to 3
 $73^\circ \rightarrow$ go to 6

Is the angle asked for a
part, or the whole?

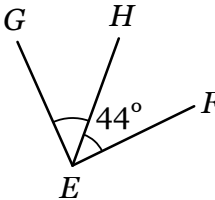


3

Ray EH bisects $\angle FEG$. **Find $m\angle FEG$.**

$22^\circ \rightarrow$ go to 5
 $88^\circ \rightarrow$ go to 1

Is the printed angle a half, or the
whole?

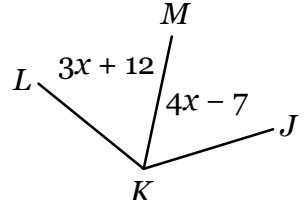


4

$m\angle JKL = 124^\circ$. **Find $m\angle MKL$.**

$63^\circ \rightarrow$ go to 2
 $17^\circ \rightarrow$ go to 7

Put x back into the part the
box names.

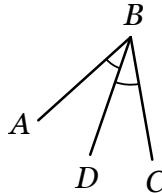


5

Ray BD bisects $\angle ABC$. $m\angle ABC = 58^\circ$. **Find $m\angle ABD$.**

$116^\circ \rightarrow$ go to 3
 $29^\circ \rightarrow$ go to 1

The whole is printed. Which angle is
asked for?

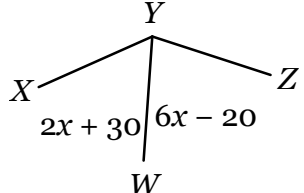


6

$m\angle XYZ = 138^\circ$. **Find $m\angle XYW$.**

$62^\circ \rightarrow$ you are out
 $16^\circ \rightarrow$ go to 7

Which expression is
written on the angle the
box names?

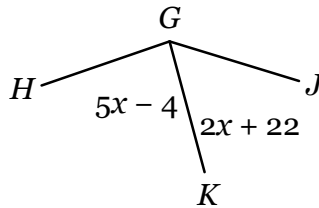


7

$m\angle HGJ = 144^\circ$.
Find $m\angle KGJ$.

$58^\circ \rightarrow$ go to 8
 $18^\circ \rightarrow$ go to 1

What does the box ask
for: x , one half, or the
whole angle?

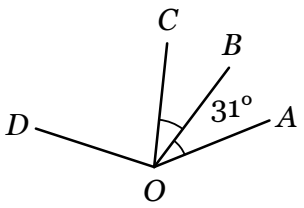


8

Ray OB bisects $\angle AOC$.
 $m\angle AOD = 140^\circ$. **Find $m\angle COD$.**

$109^\circ \rightarrow$ go to 3
 $78^\circ \rightarrow$ go to 4

Which angle does the
bisector cut in half?



Write every box number here as you go. This helps you find your way back if you forget where you are. **If you make no mistakes, you write six numbers.**

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



135 free geometry lessons — worksheets, worked answers and lesson plans.
chooseyourlesson.com

Answer Maze — answers

For the teacher

This is the route, in order. Boxes 3 and 7 are not on it. They come last in the table. A student reaches them only with a wrong answer.

5 → 1 → 8 → 4 → 2 → 6 → out

	Box	The question	Answer	Wrong answer, where it goes, and why	Right answer goes to
1	Box 5	Ray BD bisects $\angle ABC$. $m\angle ABC = 58^\circ$. Find $m\angle ABD$.	29°	116 → box 3. The student doubled instead of halving.	box 1
2	Box 1	Ray QS bisects $\angle PQR$. Find $m\angle PQR$.	112°	56 → box 7. The student gave one half, $m\angle PQS$, but the question asks for the whole angle.	box 8
3	Box 8	Ray OB bisects $\angle AOC$. $m\angle AOD = 140^\circ$. Find $m\angle COD$.	78°	109 → box 3. The student used the half as if it were all of $\angle AOC$, and did not double it.	box 4
4	Box 4	$m\angle JKL = 124^\circ$. Find $m\angle MKL$.	63°	17 → box 7. The student stopped at x , but the question asks for an angle.	box 2
5	Box 2	$m\angle MNL = 110^\circ$. Find $m\angle PNL$.	73°	147 → box 3. The student added the part to the whole.	box 6
6	Box 6	$m\angle XYZ = 138^\circ$. Find $m\angle XYW$.	62°	16 → box 7. The student stopped at x , but the question asks for an angle.	out
	Box 3	Ray EH bisects $\angle FEG$. Find $m\angle FEG$.	88°	22 → box 5. The student halved instead of doubling.	box 1
	Box 7	$m\angle HGJ = 144^\circ$. Find $m\angle KGJ$.	58°	18 → box 1. The student stopped at x , but the question asks for an angle.	box 8

Every wrong answer is a mistake students really make, not an arithmetic slip. It is the value of x , a half of the same figure, or what the figure gives when its marks are read the wrong way. Three checks are worth saying aloud. A part is smaller than its whole. Half of an acute angle is acute. Put the value of x back into both expressions.

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

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