

MYSTERY PICTURE

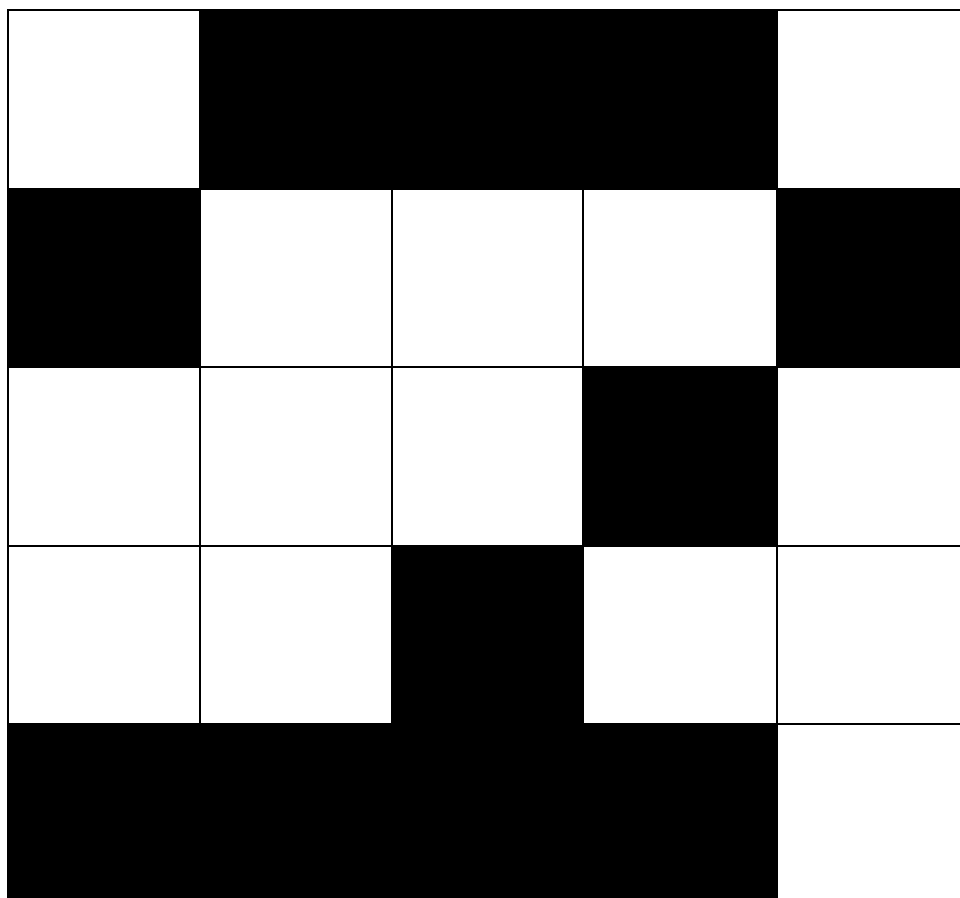


ANGLE ADDITION AND ANGLE BISECTORS

Is It the Bisector? Read the Marks

25 angles · ray or line · marks, not looks · the picture checks the answers

FREE



25 squares · 1 student sheet · answer key · 4 pages

Geometry · Grades 8–10 · chooseyourlesson.com

1. **Hand out page 3.** No protractors and no arithmetic are needed. Every square is decided by what is drawn and what is marked.
2. **Say this once:** *“A bisector is a ray that starts at the vertex. The marks must say its two parts are equal. A line through the vertex is not a ray. A ray that only looks central proves nothing.”*
3. **Fill a square with slanted lines if its stroke is the bisector. Leave it white if it is not, or if you cannot tell.** A picture appears. Eleven of the 25 are filled.

Student sheet	page 3, one per student. The bisector, “no way to tell” and a line through the vertex are printed on it as pictures.
Answers	page 4. It shows the finished picture and the reason for every square.

A square stays white for three different reasons. The student sheet says so. Five squares have a line through the vertex, and four of them have matching arcs. The line contains the bisector, but a line is not a ray, so it is not the bisector. Two squares have two different numbers, three degrees apart, and look perfectly centered. Seven squares have nothing that makes the parts equal: no marks, one arc against two, an arc on one part only, or a stroke that looks perpendicular on a straight angle. **Two filled squares are drawn clearly off-center**, but they have matching arcs. The marks are what count.

What goes wrong, and how it shows. A student who judges by the look alone gets 16 squares wrong, and one who fills every square that has any mark gets ten wrong. A student who reads the marks correctly but forgets that a bisector is a ray gets five wrong. These mistakes show clearly in the picture.

No square asks students to tell a ray from a segment. A ray is drawn as a plain stroke, and it does not end where the ink ends.



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.
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Mystery Picture

Is it the bisector?

Name _____

Period _____

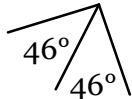
Date _____

A bisector is a ray that starts at the vertex. Its marks must say the two parts are equal: the same number of arcs on each part (size does not matter), equal numbers, or a little square in each part. Fill the square with slanted lines if its stroke is the bisector. Leave it white if the stroke is a line through the vertex, if the marks say the parts are different, or if nothing tells you they are equal. When you finish, look at the picture. If part of it is missing, check that square again.



The bisector

a ray from the vertex; one arc on each part



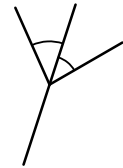
Also the bisector

equal numbers on the two parts



No way to tell

one arc against two, or no marks at all



Not a bisector

a line through the vertex is not a ray

1 	2 	3 	4 	5
6 	7 	8 	9 	10
11 	12 	13 	14 	15
16 	17 	18 	19 	20
21 	22 	23 	24 	25

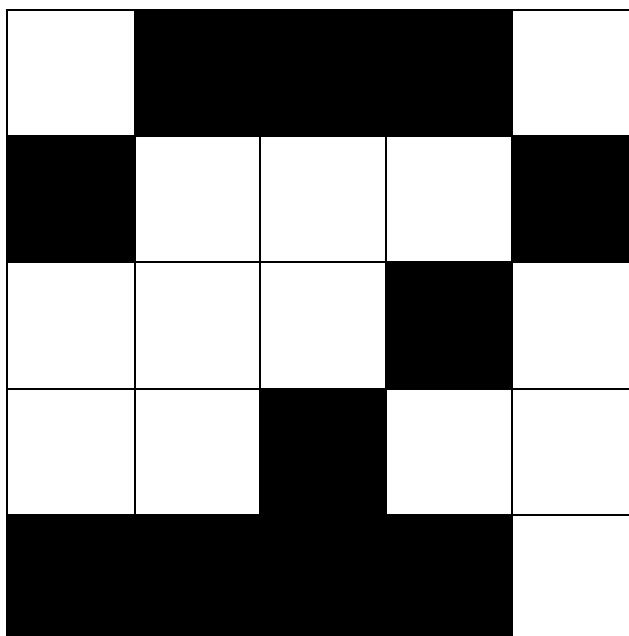


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Mystery Picture — answers

For the teacher

The finished picture is **the figure 2 — a round top, a stroke down to the left, and a flat foot along the bottom row**. The table reads left to right, the same way as the student's sheet. The squares are numbered on the student's sheet.



1–5	white (no way to tell) It looks centered, but there are no marks.	FILL The two parts have matching arcs.	FILL Matching arcs, on an obtuse angle.	FILL Matching arcs, on a narrow angle.	white (the marks differ) The parts are marked 46° and 49° , so they are not equal.
6–10	FILL Matching arcs. It is drawn off-center, but the marks count.	white (the marks differ) The parts are marked 51° and 54° , so they are not equal.	white (no way to tell) One arc on one part, two arcs on the other.	white (no way to tell) Only one part has a mark.	FILL Two arcs on each part.
11–15	white (not a ray) A line through the vertex, with matching arcs.	white (not a ray) A line through the vertex, with two arcs on each part.	white (not a ray) A line through the vertex. Both parts are marked 48° .	FILL Both parts are marked 47° .	white (no way to tell) A straight angle. The stroke looks perpendicular, but there are no marks.
16–20	white (no way to tell) It looks centered, but there are no marks.	white (no way to tell) One arc on one part, two arcs on the other.	FILL A straight angle with a little square in each half.	white (not a ray) A line through the vertex, with matching arcs.	white (no way to tell) It looks centered, but there are no marks.
21–25	FILL The two parts have matching arcs.	FILL Matching arcs. It is drawn off-center, but the marks count.	FILL Both parts are marked 58° .	FILL A straight angle with a little square in each half.	white (not a ray) A line through the vertex, with matching arcs.