

ANSWER MAZE



THE ANGLE BISECTOR THEOREM

The Angle Bisector & the Two Distances

One page · 10–15 minutes · nothing to prepare

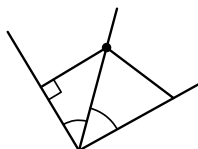
FREE

1

What do the marks tell you?

the distances must be equal → **go to 4**
no way to tell → **go to 8**

Count the little squares before you count anything else.

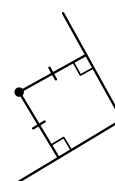


2

What do the marks tell you?

the distances must be equal →
go to 7
the dot must be on the bisector →
you are out

Turning the figure round changes nothing about which mark is the given.



3

What do the marks tell you?

the distances must be equal →
go to 6
the dot must be on the bisector →
go to 7

Which mark is the given here: the arcs, or the ticks?

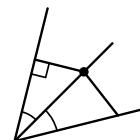


4

What do the marks tell you?

the distances must be equal →
go to 1
no way to tell → **go to 8**

A stroke is a distance only if a little square stands where it meets the side.

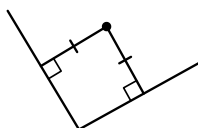


5

What do the marks tell you?

the dot must be on the bisector → **go to 2**
the distances must be equal → **go to 7**

Read the given first. The rest of the figure follows from it.

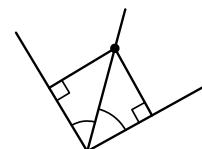


6

What do the marks tell you?

the dot must be on the bisector → **go to 7**
the distances must be equal → **go to 1**

The rule runs one way from the arcs and the other way from the ticks.

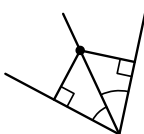


7

What do the marks tell you?

the dot must be on the bisector → **go to 3**
the distances must be equal → **go to 6**

Arcs are one given and ticks are the other. Which the figure carries decides which way the rule runs.

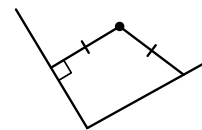


8

What do the marks tell you?

no way to tell → **go to 5**
the dot must be on the bisector → **go to 4**

Two equal strokes are not two equal distances unless both of them are distances.



1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** *“Two arcs at the corner and two little squares: then the distances are equal. Two little squares and two ticks: then the dot is on the bisector. If one square is missing, you know nothing.”*
3. **Start at box 3. Write every box number in the row at the foot as you go.** You are out after six numbers. A row longer than six means you took a wrong turn. It shows where.

Student sheet page 3, one per student. Nothing to cut, nothing to set up.
Answers page 4.

The route is 3 → 6 → 1 → 8 → 5 → 2 → out, and it is a chain: exactly one thing changes from each step to the next — **3→6** the angle opens wider; **6→1** the right-angle mark on the second stroke; **1→8** what is given changes — the arcs go and the ticks arrive; **8→5** the missing right-angle mark comes back; **5→2** the whole figure is turned round. The question is word for word the same every time, so what is being asked about is the one thing that has moved.

The three answers are the two halves of the theorem and neither of them. Arcs and two squares: the distances are equal. Two squares and equal ticks: the dot is on the bisector. A right-angle mark missing and one stroke is not a distance at all, so neither half has anything to say — which is the answer on two of the six steps, and the whole reason this lesson exists.

Boxes 4 and 7 are where a wrong answer goes, and they do not look any different. Each carries a figure, the same question, two answers, two destinations and a hint, like every other box, and both of their branches lead back on to the route. Nothing a student can read says which two they are. When they printed “not this one” and no destinations, they were the only boxes on the page with nothing under them, and *never take the branch pointing at the box with nothing under it* walked this maze — and every other maze in the unit — without reading a single mark.

What the row at the foot tells you in one glance, and it is the whole check. A row reading 3 → 6 → 1 → 8 → 5 → 2 is right, and **a clean run is six numbers**: a wrong turn always makes the row longer and never shorter, because no box can put a student further along the route than the step after the one they left. The right answer is printed first on only three of the steps and no answer is right more than twice, so neither habit walks it either. Ten ways of getting through a maze without doing any geometry are run against this route when the sheet is built, and it does not print unless all ten fail.



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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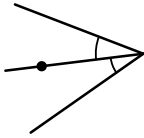
Answer Maze

Start at step 3 · the marks decide, not the drawing

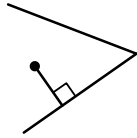
Name _____

Period _____

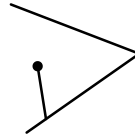
Date _____



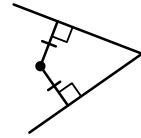
two arcs
the ray halves the angle



a square at the foot
this stroke is the distance to that side



no square
just a stroke, not a distance



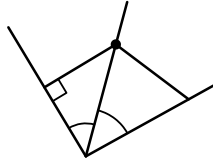
two ticks
these two strokes are equal

1

What do the marks tell you?

the distances must be equal
→ **go to 4**
no way to tell → **go to 8**

Count the little squares before you count anything else.

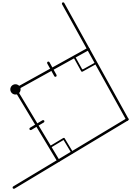


2

What do the marks tell you?

the distances must be equal →
go to 7
the dot must be on the bisector →
you are out

Turning the figure round changes nothing about which mark is the given.

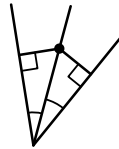


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What do the marks tell you?

the distances must be equal →
go to 6
the dot must be on the bisector →
go to 7

Which mark is the given here: the arcs, or the ticks?

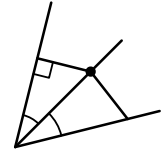


4

What do the marks tell you?

the distances must be equal →
go to 1
no way to tell → **go to 8**

A stroke is a distance only if a little square stands where it meets the side.

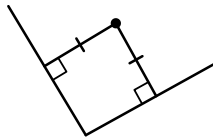


5

What do the marks tell you?

the dot must be on the
bisector → **go to 2**
the distances must be equal
→ **go to 7**

Read the given first. The rest of the figure follows from it.

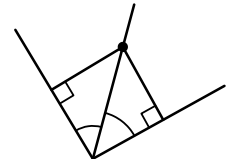


6

What do the marks tell you?

the dot must be on the
bisector → **go to 7**
the distances must be equal
→ **go to 1**

The rule runs one way from the arcs and the other way from the ticks.

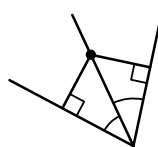


7

What do the marks tell you?

the dot must be on the bisector
→ **go to 3**
the distances must be equal →
go to 6

Arcs are one given and ticks are the other. Which the figure carries decides which way the rule runs.

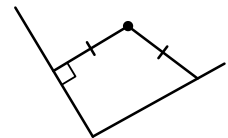


8

What do the marks tell you?

no way to tell → **go to 5**
the dot must be on the
bisector → **go to 4**

Two equal strokes are not two equal distances unless both of them are distances.



Write every box number here as you go. It shows you the way back if you get lost. **A clean run is six numbers.** A longer row means a wrong turn.

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The route, in order. The third column is the one thing that changed from the previous step; the fifth is the mistake the wrong option on that step is made of. Steps 4 and 7 are off the route and are on nobody's correct run: they carry a figure and a task like every other box, and both of their branches lead back on to the route.

#	Step	What changed	Answer	The wrong option is...	Then
1	Step 3	the first figure	the distances must be equal	runs the rule backwards — the halved angle is what is given here, not what follows	step 6
2	Step 6	the angle opens wider	the distances must be equal	runs the rule backwards again, on a wider angle	step 1
3	Step 1	the right-angle mark on the second stroke	no way to tell	counts a stroke with no right-angle mark as a distance	step 8
4	Step 8	what is given changes — the arcs go and the ticks arrive	no way to tell	takes two equal strokes for two equal distances when one of them is not a distance	step 5
5	Step 5	the missing right-angle mark comes back	the dot must be on the bisector	runs the rule forwards when the equal distances are the given	step 2
6	Step 2	the whole figure is turned round	the dot must be on the bisector	the same figure turned round, and the direction goes wrong again	out

The row at the foot should read 3 → 6 → 1 → 8 → 5 → 2. Six numbers, in that order. No wrong answer can make the row shorter than that; extra numbers mean a box off the route was visited and recovered from, which is not an error worth a mark.

The rule in one line, both ways round. Arcs at the corner and a right-angle mark on *both* strokes — the two distances are equal. A right-angle mark on *both* strokes and a tick on each — the dot is on the bisector. Take away one right-angle mark and that stroke stops being a distance, so neither half of the rule applies and there is nothing to conclude.