

ANSWER MAZE



PROVING LINES PARALLEL

Proving Lines Parallel

One page · ten minutes · nothing to prepare

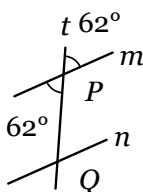
FREE

1

What do the marks tell you about m and n ?

no way to tell → **go to 7**
must be parallel →
go to 4

Same crossing, or two different ones? Ask that before anything else.

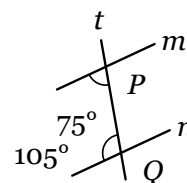


2

What do the marks tell you about m and n ?

not parallel → **go to 6**
must be parallel →
you are out

Does the pair ask for equal, or for adding to 180° ?

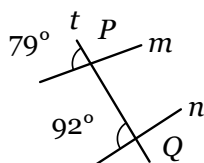


3

What do the marks tell you about m and n ?

not parallel →
go to 5
no way to tell →
go to 6

Corresponding and alternate pairs have to be equal. Same-side interior has to add to 180° .

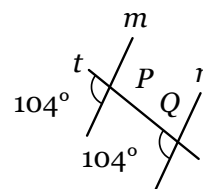


4

What do the marks tell you about m and n ?

no way to tell →
go to 1
must be parallel →
go to 7

Two angles at one crossing say nothing about the second line.



1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** *“Two angles at the same crossing tell you nothing about the second line. Nothing here is marked parallel. You are deciding whether it has to be.”*
3. **Start at box 1.** Read the marks. Choose the verdict. Go to the box it sends you to. You are out after six boxes. **Write every box number in the row at the foot as you go. If your row has more than six numbers, the row shows where it went wrong.**

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

The route is $1 \rightarrow 7 \rightarrow 3 \rightarrow 5 \rightarrow 8 \rightarrow 2 \rightarrow \text{out}$. Boxes 4 and 6 are not on it. A wrong answer sends a student there. **They look like every other box on purpose.** Each has a figure, a task, two answers and two boxes to go to, and both lead back onto the route. Nothing on the page tells a student which two boxes they are.

The answers are three words and not three numbers, and the wrong one at each step is a particular mistake. On two of the six steps the right answer is *no way to tell* — a vertical pair on one step, one angle on its own on the other — and the wrong option offered is the conclusion a student draws anyway. That is the commonest invalid conclusion in this lesson, and neither marking proves a thing: a vertical pair is equal on any two lines whatever, and one angle on its own has nothing to be compared with.

The hardest step is the one with two equal same-side interior angles. Two equal same-side interior angles make the lines parallel only when both are 90° . A student who thinks equal same-side interior angles always mean parallel lines gets this step wrong.

The right answer is not always the top line. A student who always takes the top answer does not get out. Neither does a student who gives the same answer every time.

What the row at the foot tells you in one glance, and it is the whole check. A sheet whose row reads $1 \rightarrow 7 \rightarrow 3 \rightarrow 5 \rightarrow 8 \rightarrow 2$ is right. **A clean run is six numbers;** every wrong turn makes the row longer, never shorter, because neither box off the route can put a student further along it than the step after the one they left. Any other sequence shows the exact step where it went wrong, which is more than a page of check marks would, and a student who went around once and found their way back is worth a word rather than a mark.



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 step 1 · nothing here is marked parallel

Name _____

Period _____

Date _____

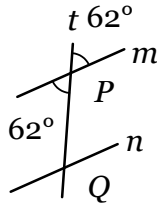
The marks are the only evidence. Do not measure. **Must be parallel** if the marks force it. **Not parallel** if the marks rule it out. **No way to tell** if they do neither.

1

What do the marks tell you about m and n ?

no way to tell → go to 7
must be parallel → go to 4

*Same crossing, or two different ones?
Ask that before anything else.*

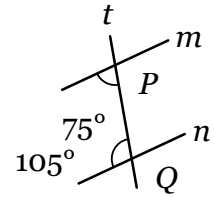


2

What do the marks tell you about m and n ?

not parallel → go to 6
must be parallel → you are out

Does the pair ask for equal, or for adding to 180°?

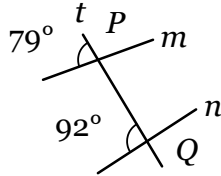


3

What do the marks tell you about m and n ?

not parallel → go to 5
no way to tell → go to 6

Corresponding and alternate pairs have to be equal. Same-side interior has to add to 180°.

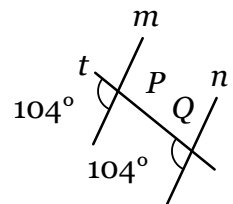


4

What do the marks tell you about m and n ?

no way to tell → go to 1
must be parallel → go to 7

Two angles at one crossing say nothing about the second line.

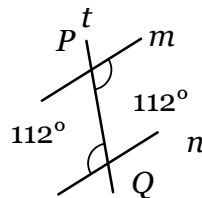


5

What do the marks tell you about m and n ?

no way to tell → go to 6
must be parallel → go to 8

Name the pair first, then ask whether the numbers do what it asks.

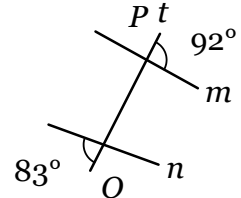


6

What do the marks tell you about m and n ?

no way to tell → go to 7
not parallel → go to 3

Which pair is this? Does it do what its name asks for?

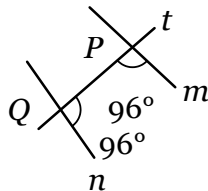


7

What do the marks tell you about m and n ?

must be parallel → go to 6
not parallel → go to 3

Two equal numbers do not always mean parallel: it depends which pair carries them.

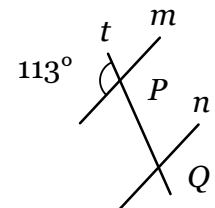


8

What do the marks tell you about m and n ?

no way to tell → go to 2
must be parallel → go to 4

Count the crossings the marks stand on before anything else.



Write every box number here as you go. It shows you the way back if you get lost. Your teacher reads this row too. A clean run is six numbers.

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



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

The route, in order. Boxes 4 and 6 are off the route and are on nobody's correct run: they carry a task like every other box, and both of their branches lead back onto the route. The last column but one is the mistake that sends a student there. **Every box carries a hint of the same shape in the same place**, so nothing on the student's page says which two are off the route.

1 → 7 → 3 → 5 → 8 → 2 → out

	Step	What is marked	Verdict	The mistake it catches	Sends them to
1	Step 1	vertical pair 62°, 62°	no way to tell	a vertical pair is equal, so the lines must be parallel	step 7
2	Step 7	same-side interior 96°, 96°	not parallel	same-side interior angles are equal, so the lines are parallel	step 3
3	Step 3	corresponding 79°, 92°	not parallel	the corresponding pair does not match, so nothing can be told	step 5
4	Step 5	alternate interior 112°, 112°	must be parallel	the pair does exactly what its name asks, and the student still will not conclude	step 8
5	Step 8	one angle only 113°	no way to tell	the drawing looks parallel and one angle is given, so the lines are parallel	step 2
6	Step 2	same-side interior 75°, 105°	must be parallel	the same-side interior angles are not equal, so the lines are not parallel	out

Why a wrong answer here is worth reading. Every wrong option on this sheet is a conclusion somebody really draws, and they fall into three kinds. Two come from treating a marking that settles nothing — two angles at one crossing, or a single angle — as evidence about a second line that was never measured. Two are the refusal to conclude anything when the marks settle it plainly, which is the other half of what this lesson is for. Two come from forgetting what a named position asks for: equal, for corresponding and alternate; adding to 180°, for same-side interior.