

CUT & GLUE SORT

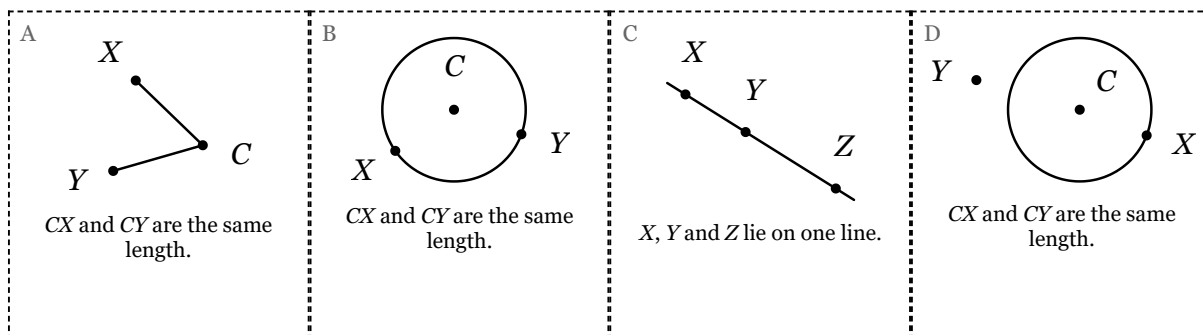


INTRO TO CONSTRUCTIONS: TOOLS AND RULES

Construction or Accurate Drawing? What the Marks Prove

Proved · shown false · no mark says either way

FREE



Cut & Glue Sort — how to run it

25 minutes, including the cutting

1. **Hand out pages 3 and 4**, one of each per student, and scissors and glue. A compass each helps.
2. **Say this once:** *“A circle or a line on the page is evidence. A picture that only looks right is not evidence. It does not matter how carefully it is drawn.”*
3. **Every row gets 4.** A row with more or fewer has a piece in the wrong place. (This is on your page only, not the student's.)

Student sheets pages 3 and 4, one of each per student.

Answers page 5.

The third row is the hard one: a drawing can be exactly right and still prove nothing. The four pieces in *no mark says either way* are drawn exactly as their sentence says. Two segments really are the same length, three dots really are in line, and a point really is as far from X as from Y. A student who checks one with a compass will find it right. That is fine, because measuring afterwards is a check. But nothing on the piece records it, so the piece proves nothing. Two pages can look the same, and only the one with the circle or line on it is a construction. One piece in this row has an arc through the right two points, but the arc is centered at the wrong point.

The middle row is not the “looks wrong” row. On two of its pieces the point is only about 2.7 mm off its arc or line. That is easy to miss at a glance. It is plain when a pencil point is run along the curve. A student who simply trusts the drawing gets only six of the twelve pieces right.

Only two things count as proof on this sheet. First, two points on one circle are the same distance from its center, and the compass makes sure of that. Second, a straight line drawn through two marked points shows which other points lie on it.



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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What does the page prove?

Construction marks are evidence

Name _____

Period _____

Date _____

Cut out the twelve pieces on the next page. Each piece is a finished page with one sentence under it. Every point that was marked has a dot. Glue each piece into its row. **Two points on one circle are always the same distance from its center. A straight line drawn through two marked points shows whether a third marked point lies on that same line. A page that only looks right proves nothing. That kind of page is an accurate drawing, not a construction.**

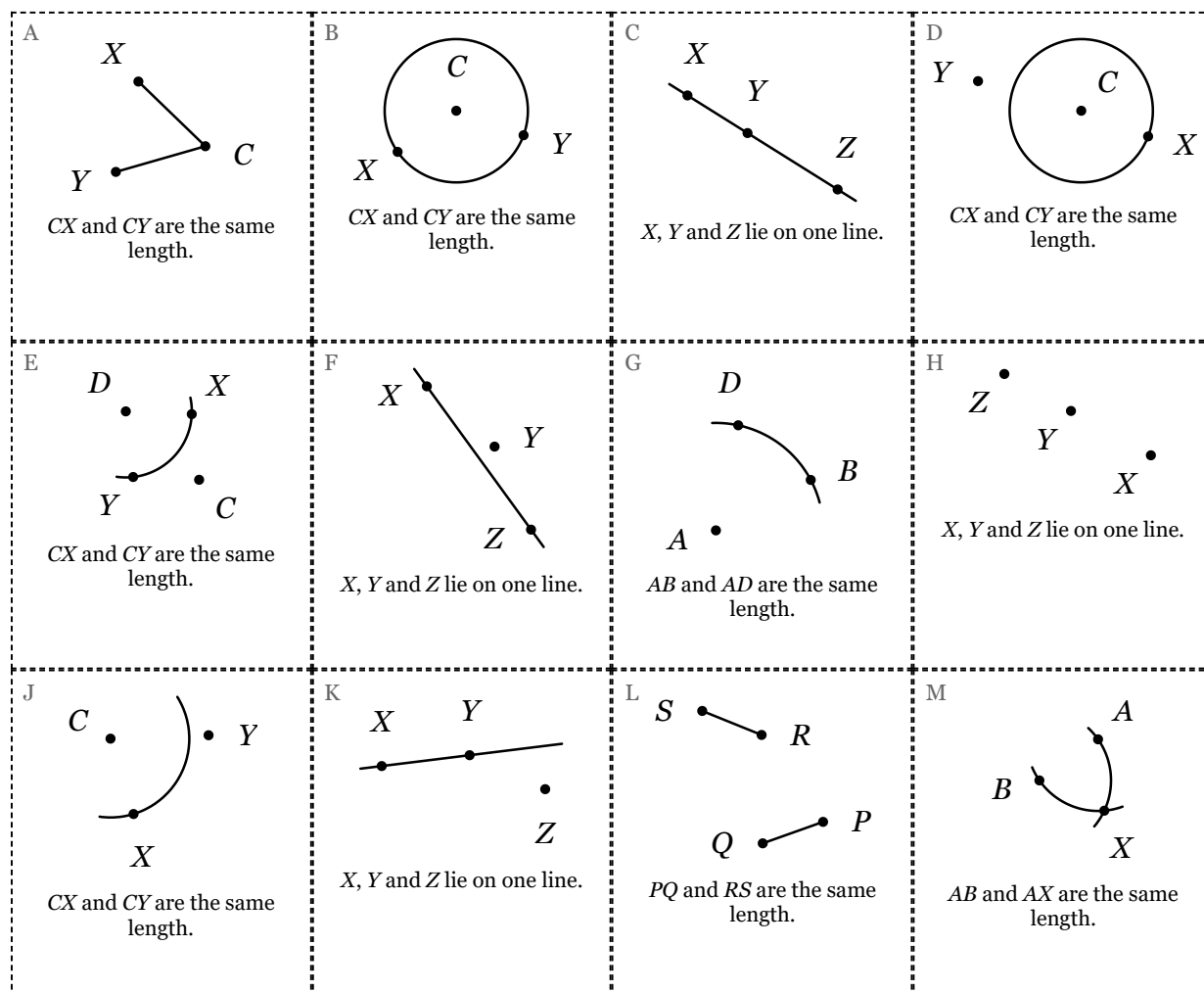
CORRECT: THE MARKS PROVE IT TRUE — *a circle or line on the page makes it true*

WRONG: THE MARKS PROVE IT FALSE — *a circle or line on the page contradicts it*

NO PROOF: NOTHING SAYS EITHER WAY — *it may look right, but nothing on the page records it*

The twelve pieces

Cut along the dotted lines



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Cut & Glue Sort — answers

For the teacher

CORRECT: THE MARKS PROVE IT TRUE	B — X and Y are both on the circle centered at C	C — one line runs through all three	G — B and D are both on the arc centered at A	M — X is on the arc centered at A through B
WRONG: THE MARKS PROVE IT FALSE	D — X is on the circle centered at C; Y is well outside it	F — the line through X and Z misses Y	J — the arc centered at C runs through X and just misses Y	K — the line through X and Y passes well away from Z
NO PROOF: NOTHING SAYS EITHER WAY	A — two segments drawn exactly equal — but no circle	E — the arc through X and Y is centered at D, not C	H — three dots exactly in line — but no line drawn	L — drawn exactly equal — but no arc carries the opening

Every mark on every piece can really be made with a compass and a straightedge. Each line goes through two dots. Each circle or arc is centered at a dot and passes through a dot. So the only question on this sheet is what the marks prove.