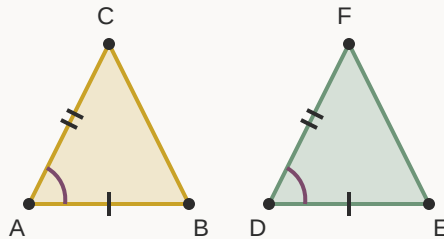


Worksheet: Proposition 4

If two triangles have two sides equal to two sides respectively, and have the angles contained by the equal straight lines equal, then they also have the base equal to the base, the triangle equals the triangle, and the remaining angles equal the remaining angles respectively.



Triangles ABC and DEF: $AB = DE$, $AC = DF$, angle $A =$ angle D implies congruence

Student Name: _____

Date: _____

Part A: Construction Practice

Draw and label the diagram described in Proposition 4. Mark all given information.



After completing, answer:

1. What tools did you use, and in what order?

2. Which postulates justify each step of your construction?

Part B: Proof Justification

Below is the proof broken into steps. For each step, write the toolkit item that justifies it.

Available Toolkit:

- CN4 — Coincidence Implies Equality
- D8 — Plane Angle
- P1 — Draw a Line
- D20 — Types of Triangles (by sides)
- CN1 — Transitivity of Equality
- P3 — Draw a Circle

Step	Statement	Justification
1	Place triangle ABC on triangle DEF, aligning A with D	
2	Since $AB = DE$, point B coincides with E	
3	Since $\angle BAC = \angle EDF$, ray AC falls along ray DF	
4	Since $AC = DF$, point C coincides with F	
5	B coincides with E and C coincides with F, so BC coincides with EF	
6	The triangles coincide entirely, so all corresponding parts are equal	

Part C: Thinking Deeper

Question 1: Why does Euclid need to 'move' one triangle onto another? Is this really a proof?

Question 2: What if we knew two sides and a NON-included angle? Would that be enough?

Question 3: Why is the angle between the two sides (the 'included' angle) so important?

Part D: Challenge Problem

Can you think of a situation where Proposition 4 would be useful in proving something else? Describe it below.

Part E: Self-Assessment

Reflect honestly on your understanding. There are no wrong answers here.

1. Could you explain to someone else why this proof works, without looking at your notes?

- ☐ Yes, I could explain the whole proof
- ☐ I could explain most of it but might get stuck
- ☐ I'd need to look at the steps again

2. Which part of this lesson was hardest for you?

- ☐ Drawing the construction / diagram
- ☐ Understanding why the proof works (the logic)
- ☐ Matching proof steps to toolkit items
- ☐ The extension questions

3. What would you do differently next time?
