2 Dimensional Euclid

definitions & theorems from Origametry by Daniel Heath.

While working in a group make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

1. Given a line l, on patty paper and a point A not on the line, what steps can you take to fold a line through A that is parallel to l?

2. Begin with two parallel lines on a sheet of patty paper an fold any transversal over the parallel lines. What can you say about the alternating interior angles?

Theorem 6.4. *If two distinct lines l_1 and l_2 are parallel, then there is a unique fold ϕ that takes l_1 to l_2.*

3. Begin with patty paper with two parallel lines l and m and a point A not on either line. Let ϕ_l be the fold with crease l and ϕ_m be the fold with crease m.

(a) Find $\phi_l(A) = A'$ and $\phi_m(A') = B$.

(b) Fold the line $\overleftrightarrow{AB}$ and mark points $C = l \cap \overleftrightarrow{AB}$ and $D = m \cap \overleftrightarrow{AB}$.

(c) Find a relationship between AB and CD that is true in general.

Theorem 6.7. *Let l and m be parallel lines, and ϕ_l and ϕ_m be the fold with crease l and m respectively. Let A be any point and $B = \phi_m \circ \phi_l$. Then $l \perp \overleftrightarrow{AB}$ and $AB =$??*