This homework is due Friday, February 19, 2021.

Definition 1. A polygon is *convex* if any line segment connecting two points on the polygon is contained inside the polygon. This is equivalent to the condition that all of its interior angles are less than $180°$.

Problem 1. Show that every convex quadrilateral is divided by its diagonals into proportional triangles.

Problem 2. Let $\triangle ABC$ be an isosceles triangle, with $AB = AC$.
Let D be a point on $\overline{AC}$ such that $\overline{BD}$ bisects $\angle ABC$ and $\triangle BCD \sim \triangle ABC$.

(a) Carefully draw this.

(b) Find $m\angle ABC$ and $m\angle BAC$.

(c) Show that $\triangle DAB$ is isosceles.

(d) *Challenge:* Find $\dfrac{AB}{BC}$.