Problem 1 – An isosceles triangle

Triangle *ABC* is shown on page 1.3.

- Make a conjecture about the angle measures and the lengths of the opposite sides of an isosceles triangle.

- In an isosceles triangle, when is the measure of the vertex angle *greater than* the measure of either base angle? When is it *less than* the measure of either base angle?

Problem 2 – Exterior and remote interior angles

Triangle *DEF* is shown on page 2.2.

- How are the largest angle and longest side related?

- How are the smallest angle and smallest side related?

Complete each statement.

- In a triangle, the measure of an exterior angle is *equal to* _____.

- $m\angle GEF >$ _____

- $m\angle GEF >$ _____

- In a triangle, the measure of an exterior angle is *greater than* _____.

Problem 3 – The perpendicular distance

On page 3.2, $\overline{PM} \perp \overline{XY}$.

- Make a conjecture about the lengths of $\overline{PM}$ and $\overline{PQ}$.

Prove the following statement:

*The perpendicular segment from a point to a line is
the shortest segment from the point to the line.*

Given: $\overline{PM} \perp \overline{XY}$

Prove: $\overline{PQ} > \overline{PM}$

Statements	Reasons

Challenge: Prove the same statement using a different approach.

Given: $\overline{PM} \perp \overline{XY}$

Prove: $\overline{PQ} > \overline{PM}$

Statements	Reasons