6 Most ironing boards can be adjusted to different heights. One ironing board, with a design similar to the one shown here, has legs that are each 110 cm long and are hinged at a point that is 40 cm from the top end of each. Possible working heights are 90 cm, 85 cm, 80 cm, 75 cm, and 70 cm.

a. Make a sketch of the ironing board, labeling vertices of important triangles. Carefully explain why, for any of the working heights, the surface of the ironing board is parallel to the floor.

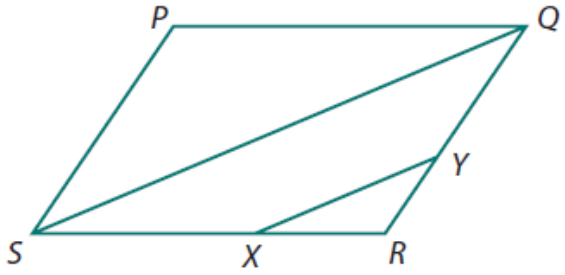
b. For a working height of 90 cm, determine the distance between the two points at which the legs connect to the ironing board. Find the measures of the angles of the top triangle.

9 In the diagram below, quadrilateral $PQRS$ is a parallelogram, $\overline{SQ}$ is a diagonal, and $\overleftrightarrow{SQ} \parallel \overleftrightarrow{XY}$.

a. Prove that $\triangle XYR \sim \triangle SQR$.

b. Prove that $\triangle XYR \sim \triangle QSP$.

c. Identify the center and magnitude of a size transformation that maps $\triangle RXY$ onto $\triangle RSQ$.



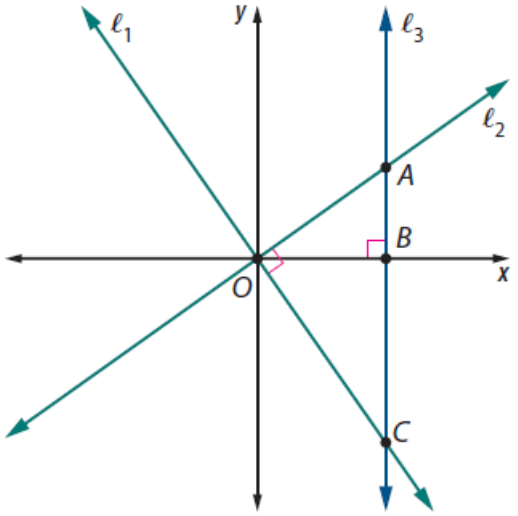
15 In the Course 2 *Coordinate Methods* unit, you discovered that two nonvertical lines in a coordinate plane are perpendicular if and only if their slopes are opposite reciprocals. In this task, you will prove that *if* the lines are perpendicular, *then* the slopes are opposite reciprocals. In Extensions Task 27, you will prove the converse. You now have the necessary tools to prove these claims. In the diagram at the right, $\ell_1 \perp \ell_2$.

a. Why can line ℓ_3 be drawn through point A on ℓ_2 perpendicular to the x-axis?

b. What is the slope of ℓ_1? Of ℓ_2?

c. Prove that $\triangle AOB \sim \triangle OCB$.

d. Using Parts b and c, justify that the slopes of ℓ_1 and ℓ_2 are opposite reciprocals.



22 How could you use a size transformation to explain why a circle of radius 5 is similar to a circle of radius 12? Why any two circles are similar?

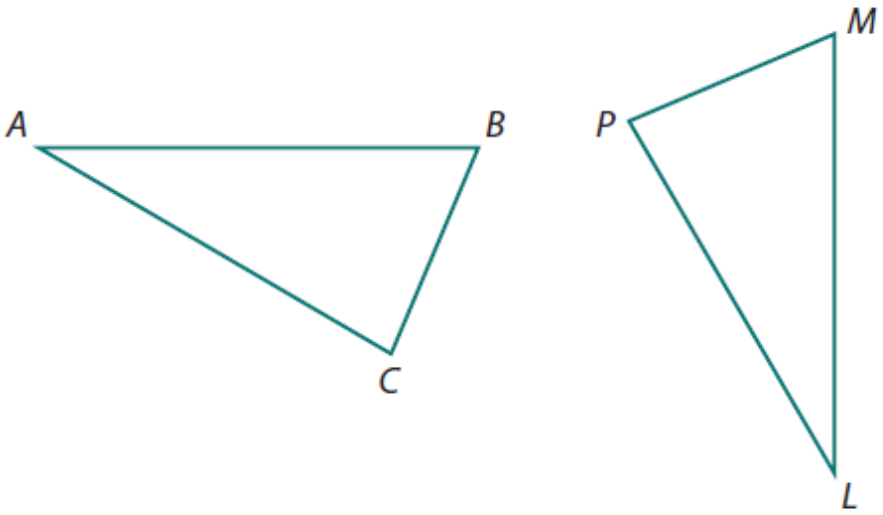
37 Find the solution to each inequality. Display your solution two ways, using symbols and using a number line graph.

a. $x^2 + 3x < x + 8$

b. $\frac{20}{x} \geq 10$

c. $2x + 3 > x^2 + 5$

39 $\triangle ABC \cong \triangle LMP$. Complete each statement about the relationships between the corresponding side lengths and angle measures of the two triangles.



a. $AB =$ _____

b. $MP =$ _____

c. $CA =$ _____

d. $m\angle B =$ _____

e. $m\angle A =$ _____

f. $m\angle P =$ _____