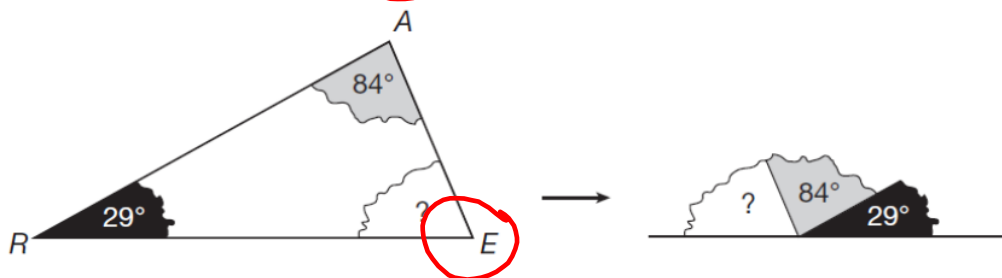


7.1

Estimating and Measuring Angles

Try These

- i) The 3 angles in $\triangle ARE$ form a straight line, which measures 180° .
- ii) What is the measure of $\angle E$? $180^\circ - 84^\circ - 29^\circ = 67^\circ$



You can tell the measure of some angles without measuring.

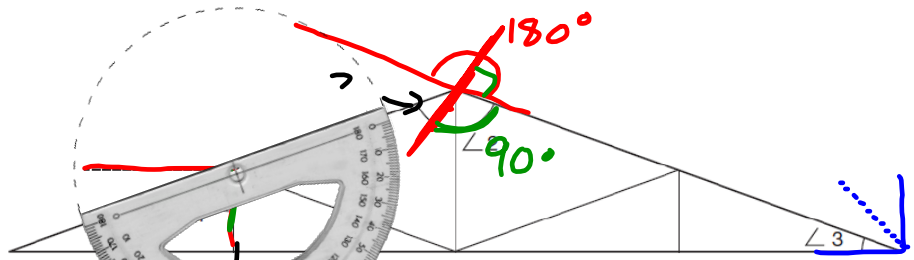


- 1 What is the angle measure of a square corner of paper? 90°
right angle
- 2 What angle measure do you get when you fold a square along its diagonal? 45° *90° ÷ 2*
- 3 What angle measure do you get when you fold the square so that the diagonal meets the base? 22.5°
45° ÷ 2

You can use **referents** like the angles above to estimate the measures of other angles.

Example 1

Estimate the measure of each angle marked on the sketch of the roof truss. (The first one is done for you.)



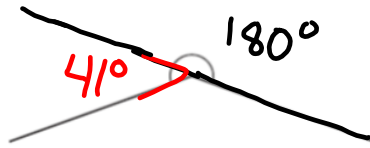
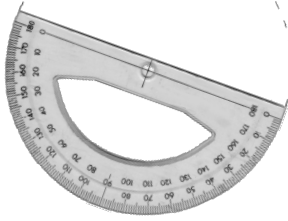
∠1: a bit less than more than 90°
Estimate: about 70° Estimate: 135° ∠3: less than 45°
Estimate: 20°

Solution

- A. Draw a dotted line to show how close the angle is to 90° or 180°.
- B. Estimate the angle measure by comparing it with the referent angle you drew in Part A.

Example 2

What is the measure of the reflex angle at the peak of the roof truss?



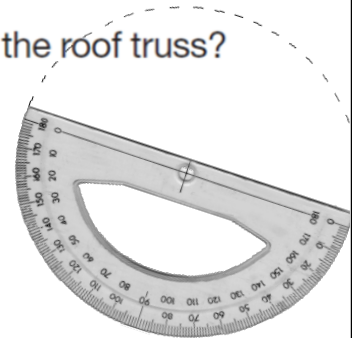
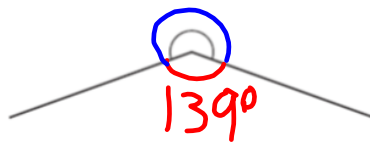
Solution 1

- A. Extend an arm to form a straight angle.
- B. Measure the acute angle in the arc using a protractor and add it to 180° .

$$180^\circ + \underline{41^\circ} = \underline{221^\circ}$$

Example 2

What is the measure of the reflex angle at the peak of the roof truss?



Solution 2

- A. Measure the obtuse angle using a protractor. 139°
- B. Subtract that measure from the total number of degrees around a point.

$$360^\circ - \underline{139^\circ} = \underline{221^\circ}$$

Example 3

The elevation angle of a solar panel on a house should be between 25° and 70° . Albert, a building contractor, wants to install solar panels on a roof at an angle of 55° . Draw a 55° angle for the roof.

Solution

- A. Draw one arm of the angle.
- B. Use a protractor to locate a point on the other arm.
Draw this arm.
- C. Mark the arc and label the angle measure.

