Example: Interior Angles in a Polygon

Problem:

Find the measure of angle D. The polygon is a five-sided figure called a pentagon. Angle A measures 3x minus 11 degrees, angle B measures x + 8 degrees, angle C measures x degrees, angle D measures 2x + 7 degrees, and angle E measure x minus 8 degrees.

Solution:

First, we need to find the sum of the measures of the angle of the pentagon. Use the polygon sum theorem and take 180 times the number of sides, or 5, minus 2. The sum of the angles is 540 degrees.

Set the sum of all the angle measures equal to 540 degrees. 540 is equal to 3x minus 11 plus x plus 8 plus x plus 2x plus 7 plus x minus 8. Combine like terms. 3x plus x plus x plus 2x plus x is equal to 8x. Negative 11 plus 8 plus 7 minus 8 is equal to negative 4.

540 is equal to 8x minus 4. To isolate 8x, add 4 to both sides.

544 is equal to 8x. Divide both sides by 8 to find the value of x.

68 is equal to x.

Angle D is equal to 2x plus 7. Substitute the value of x into the equation find the measure of angle D.

2 times 68 plus 7 is equal to 143 degrees. The measure of angle D is 143 degrees.