Interior And Exterior Angles:

A. Interior angles of a regular polygon:

1. For any polygon, the sum of the interior angles is always:

   180 x (n-2), where 'n' is the number of sides

2. The measure of one interior angle of a regular polygon is determined by the formula:

$$\frac{180\times(n-2)}{n}$$

B. Exterior angles of a regular polygon:

1. For all regular polygons, the exterior angle is determined by:

$$\frac{360}{n}$$

C. Note: All the above values are specified in terms of degrees. To convert to radians see *Converting To Radians*.

D. Examples

Ex [1] Each interior angle of a regular n-agon is 120^{o}. Then n = _____.

a. To solve this problem we need to set up an equation using the fact that each interior angle is $\frac{180\times(n-2)}{n}$.

b. So we know $120 = \frac{180\times(n-2)}{n}$. Solving this equation we get 120n = 180n - 360 or 60n = 360. Solving, we get n = 6.

c. The answer is 6.

Ex [2] If the sum of the interior angles of a regular polygon is 1440 ^{o}, then the number of sides of the polygon is _____.

a. Since the sum of the interior angles is 180 (n -2), we can set up the equation 180 (n-2) = 1440.

b. $^{1440}/_{180} = 8$. So n - 2 = 8, or n = 10.

c. The answer is 10.

Ex [3] The exterior angle of a regular octagon is _____ degrees.

a. Since $^{360}/_{n}$ is the formula we use for the exterior angles, we simply divide 360 by 8 which is 45.

b. The answer is 45.