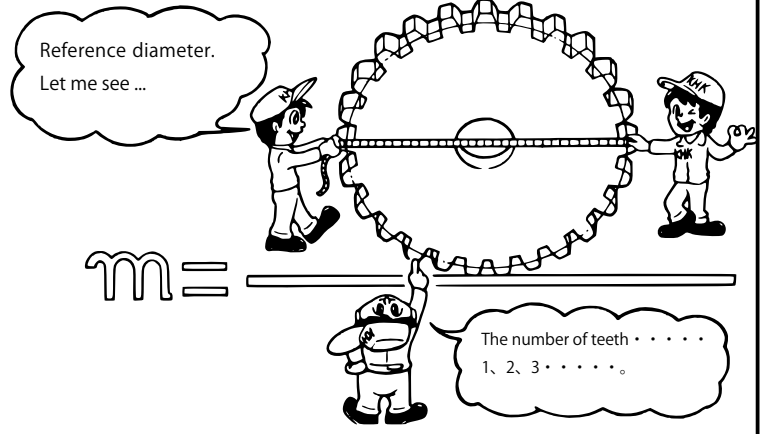


# The Module of a Gear



$$m = \frac{\text{Reference diameter}}{\text{Number of teeth}}$$

"Module" is the unit of size that indicates how big or small a gear is. It is the ratio of the reference diameter of the gear divided by the number of teeth.

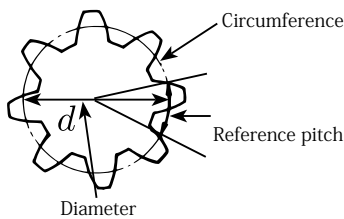
Thus:  $m = \frac{d}{z}$  (Module =  $\frac{\text{Reference diameter}}{\text{Number of teeth}}$  )

The mutual relation between the module and the reference diameter, etc. is as follows:

- Reference diameter  $d = mz$  (Reference diameter = Module  $\times$  Number of teeth )
- Number of teeth  $z = \frac{d}{m}$  (Number of teeth =  $\frac{\text{Reference diameter}}{\text{Module}}$  )
- Reference pitch  $p = \pi m$  (Reference pitch =  $\pi \times$  Module )

Then, what is the reference pitch?

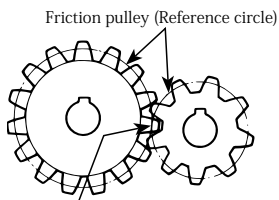
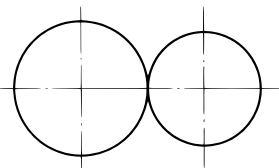
It is equal to the circumference divided by the number of teeth.



$$\text{Reference pitch} = \frac{\text{Circumference } (\pi d)}{\text{Number of teeth } (z)}$$

Then, what is the reference circle?

Assume that there are two friction pulleys in contact whose diameters are equal to the reference diameters. As the surfaces are smooth, the rotation will not go properly when great force is applied. This problem will be solved if there are teeth on the periphery of the friction pulley. And this is the concept of gearing.



Both reference circles come in contact

[Summary]

- (1) The module describes the size of a gear.
- (2) A pair of gears can only mesh correctly if and when the base pitch is the same.