

The **cycloid** is a curve traced by any point rigidly attached to a circle of radius a , at distance b from the center, when this circle rolls without slipping on a fixed straight line. The equation is:

$$\begin{aligned}x &= a\theta - b \sin \theta \\y &= a - b \cos \theta\end{aligned}\tag{1}$$

Where θ = the angle which the moving radius makes with the line of centers
The curve is called prolate or curtate according as $b < a$ or $b > a$, as in Figure 1 and 2 respectively. When $b = a$, as in Figure 3, the special case of the cycloid arises.

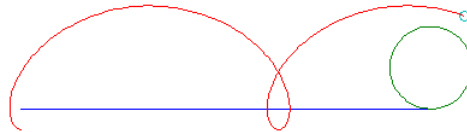


Figure 1

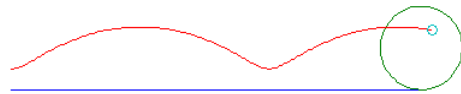


Figure 2

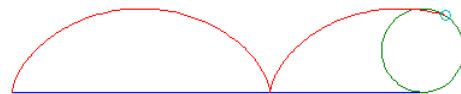


Figure 3

References:

1. Korn, G.A. and Korn T.M., *Mathematical Handbook for Scientists and Engineers*, McGraw-Hall, 1986.
2. Baumeister, T., Avallone, E.A. and Baumeister III, T., *Mark's Standard Handbook for Mechanical Engineers*, eighth edition, McGraw-Hall, 1978.