

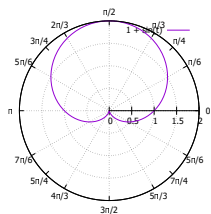
# Precalculus Honors Reference Sheet

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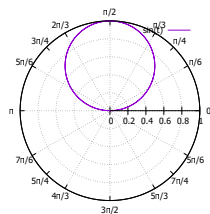
June 4, 2025

$$\begin{array}{llll}
 S_n = \frac{n}{2}(a_1 + a_n) & \sum_{i=1}^n i = \frac{n}{2}(1+n) & f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} & a \cdot b = ||a|| \cdot ||b|| \cos \theta \\
 S_n = \frac{a_1(1-r^n)}{1-r} & \sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6} & \lim_{x \rightarrow 0} \frac{\sin(Ax)}{Ax} = 1 & c^2 = a^2 + b^2 - 2ab \cdot \cos C \\
 S_\infty = \frac{a_1}{1-r} & \sum_{i=1}^n i^3 = \left(\frac{n}{2}(1+n)\right)^2 & \lim_{x \rightarrow 0} \frac{1 - \cos(Ax)}{Ax} = 0 & \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \\
 & & & x = r \cos \theta \\
 & & & y = r \sin \theta
 \end{array}$$

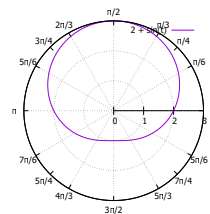
(a) Cardioid



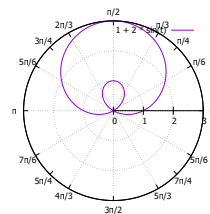
(b) Circle



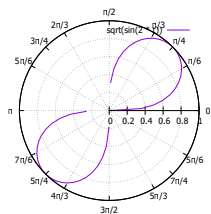
(c) Dimpled Limaçon



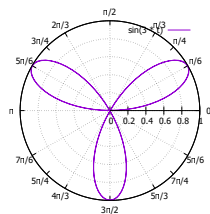
(d) Looped Limaçon



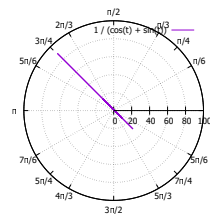
(e) Lemniscate



(f) Rose



(g) Line



(h) Parabola

