

1. 弧度法

$$180^\circ = \pi \text{ (ラジアン)}$$

$$\alpha^\circ = \frac{\pi}{180} \alpha \text{ (ラジアン)}$$

$$\alpha \text{ (ラジアン)} = \frac{\pi}{180} \alpha^\circ$$

2. 定義

$$\operatorname{cosec} \alpha = \frac{1}{\sin \alpha}$$

$$\sec \alpha = \frac{1}{\cos \alpha}$$

$$\cot \alpha = \frac{1}{\tan \alpha}$$

3. 符号

象限				
sin θ	+	+	-	-
cos θ	+	-	-	+
tan θ	+	-	+	-

4. 基本公式

$$\sin^2 \alpha + \cos^2 \alpha = 1$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha}$$

5. 還元公式

$$\sin(-\alpha) = -\sin \alpha$$

$$\cos(-\alpha) = \cos \alpha$$

$$\tan(-\alpha) = -\tan \alpha$$

$$\sin(90^\circ + \alpha) = \cos \alpha$$

$$\sin(90^\circ - \alpha) = \cos \alpha$$

$$\cos(90^\circ + \alpha) = -\sin \alpha$$

$$\cos(90^\circ - \alpha) = \sin \alpha$$

$$\tan(90^\circ + \alpha) = -\cot \alpha$$

$$\tan(90^\circ - \alpha) = \cot \alpha$$

$$\sin(180^\circ + \alpha) = -\sin \alpha$$

$$\sin(180^\circ - \alpha) = \sin \alpha$$

$$\cos(180^\circ + \alpha) = -\cos \alpha$$

$$\cos(180^\circ - \alpha) = -\cos \alpha$$

$$\tan(180^\circ + \alpha) = \tan \alpha$$

$$\tan(180^\circ - \alpha) = -\tan \alpha$$

$$\sin(270^\circ + \alpha) = -\cos \alpha$$

$$\sin(270^\circ - \alpha) = -\cos \alpha$$

$$\cos(270^\circ + \alpha) = \sin \alpha$$

$$\cos(270^\circ - \alpha) = -\sin \alpha$$

$$\tan(270^\circ + \alpha) = -\cot \alpha$$

$$\tan(270^\circ - \alpha) = \cot \alpha$$

$$\sin(360^\circ + \alpha) = \sin \alpha$$

$$\sin(360^\circ - \alpha) = -\sin \alpha$$

$$\cos(360^\circ + \alpha) = \cos \alpha$$

$$\cos(360^\circ - \alpha) = \cos \alpha$$

$$\tan(360^\circ + \alpha) = \tan \alpha$$

$$\tan(360^\circ - \alpha) = -\tan \alpha$$

6. 加法定理

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$$

7. 2倍角の公式

$$\sin 2\alpha = 2 \sin \alpha \cos \alpha$$

$$\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha$$

$$= 1 - 2 \sin^2 \alpha = 2 \cos^2 \alpha - 1$$

$$\tan 2\alpha = \frac{2 \tan \alpha}{1 - \tan^2 \alpha}$$

8. 3倍角の公式

$$\sin 3\alpha = 3 \sin \alpha - 4 \sin^3 \alpha$$

$$\cos 3\alpha = 4 \cos^3 \alpha - 3 \cos \alpha$$

$$\tan 3\alpha = \frac{3 \tan \alpha - \tan^3 \alpha}{1 - 3 \tan^2 \alpha}$$

9. 半角の公式

$$\sin^2 \frac{\alpha}{2} = \frac{1 - \cos \alpha}{2}$$

$$\cos^2 \frac{\alpha}{2} = \frac{1 + \cos \alpha}{2}$$

$$\tan^2 \frac{\alpha}{2} = \frac{1 - \cos \alpha}{1 + \cos \alpha}$$

10. 累乗の公式

$$\sin^2 \alpha = \frac{1 - \cos 2\alpha}{2}$$

$$\cos^2 \alpha = \frac{1 + \cos 2\alpha}{2}$$

$$\sin^3 \alpha = \frac{3 \sin \alpha - \sin 3\alpha}{4}$$

$$\cos^3 \alpha = \frac{\cos 3\alpha + \cos \alpha}{4}$$

11. 和・差の公式

$$\sin \alpha + \sin \beta = 2 \sin \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$$

$$\sin \alpha - \sin \beta = 2 \cos \frac{\alpha + \beta}{2} \sin \frac{\alpha - \beta}{2}$$

$$\cos \alpha + \cos \beta = 2 \cos \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$$

$$\cos \alpha - \cos \beta = -2 \sin \frac{\alpha + \beta}{2} \sin \frac{\alpha - \beta}{2}$$

$$\tan \alpha \pm \tan \beta = \frac{\sin(\alpha \pm \beta)}{\cos \alpha \cos \beta}$$

12. 積の公式

$$\sin \alpha \sin \beta = \frac{1}{2} \{ \cos(\alpha - \beta) - \cos(\alpha + \beta) \}$$

$$\cos \alpha \cos \beta = \frac{1}{2} \{ \cos(\alpha - \beta) + \cos(\alpha + \beta) \}$$

$$\sin \alpha \cos \beta = \frac{1}{2} \{ \sin(\alpha - \beta) + \sin(\alpha + \beta) \}$$

13. 合成の公式

$$a \sin \theta + b \cos \theta = \sqrt{a^2 + b^2} \sin(\theta + \alpha) \quad (\tan \alpha = \frac{b}{a})$$

14. 正弦定理

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R$$

15. 余弦定理

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = c^2 + a^2 - 2ca \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

16. 三角形の面積の公式

$$S = \frac{1}{2} bc \sin A = \frac{1}{2} ca \sin B = \frac{1}{2} ab \sin C$$

$$S = \sqrt{k(k-a)(k-b)(k-c)}$$

$$(k = \frac{a+b+c}{2})$$

$$S = \frac{1}{2} r(a+b+c) \quad (r \text{ は内接円の半径})$$

17. 扇形の公式

$$l = r\alpha$$

$$S = \frac{1}{2} rl = \frac{1}{2} r^2 \alpha$$

18. ド・モアブルの定理

$$(\cos \alpha + i \sin \alpha)^n = \cos n\alpha + i \sin n\alpha$$