2025 7 20

1. $f(x)$ $\mathbf{R}$ $f(x-1)$ $f(x+1)$ $x \in [1,3]$ $f(x) = kx + m$ $f(0) - f(3) = -2$ $f(2022)$

2. $f(x)$ $\mathbf{R}$ x $f(x+2) = f(-x)$ $f(x) = -f(4-x)$ $x \in [0,2]$ $f(x) = 2x - x^2$.

   1. $x \in [2,4]$ $f(x)$;

   2. $f(0) + f(1) + f(2) + f(3) + f(4) + \cdots + f(2022)$;

3. $f(x)$ $g(x)$ $\mathbf{R}$ $f(x)+g(x)=a^x+\ln(\sqrt{x^2+1}+x)-\sin x(a>0\ a\neq 1)$. $\forall t\in\mathbf{R}$ $F(x)=e^{|x-3t-2022|}-\mu f(x-3t-2022)-2\mu^2$ μ .

4. $f(x)=\log_a(3-x)\ g(x)=\log_a(3+x)(a>0,a\neq 1)$ $F(x)=f(x)-g(x)$. a $F(x)$ $[a,b]$ $[1-\log_a n,1-\log_a m]$.

5. $f(x)=\begin{cases}3^x, & 0\leq x\leq 1,\\ 3+\log_{\frac{1}{2}}x, & 1<x\leq 32\end{cases}$ $g(x)=2x^2-x$ $y=g(f(x))-t$ t .

1. $\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$;
2. $\cos(\alpha+\beta)=\cos\alpha\cos\beta-\sin\alpha\sin\beta$;
3. $\sin(\alpha-\beta)=\sin\alpha\cos\beta-\cos\alpha\sin\beta$;
4. $\cos(\alpha-\beta)=\cos\alpha\cos\beta+\sin\alpha\sin\beta$;
5. $\sin(2\alpha)=2\sin\alpha\cos\alpha$;
6. $\cos(2\alpha)=\cos^2\alpha-\sin^2\alpha=2\cos^2\alpha-1=1-2\sin^2\alpha$;
7. $\sin(\frac{\alpha}{2})=\sqrt{\frac{1-\cos\alpha}{2}}$;
8. $\cos(\frac{\alpha}{2})=\sqrt{\frac{1+\cos\alpha}{2}}$;
9. $\sin(\alpha)+\sin(\beta)=2\sin\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$;
10. $\cos(\alpha)+\cos(\beta)=2\cos\left(\frac{\alpha+\beta}{2}\right)\cos\left(\frac{\alpha-\beta}{2}\right)$;
11. $\sin(\alpha)\cos(\beta)=\frac{1}{2}\left(\sin(\alpha+\beta)+\sin(\alpha-\beta)\right)$;
12. $\cos(\alpha)\cos(\beta)=\frac{1}{2}\left(\cos(\alpha+\beta)+\cos(\alpha-\beta)\right)$.

1. $\alpha\in(0,\pi)$ $\quad\dfrac{(1+\sin\alpha+\cos\alpha)\cdot(\cos\frac{\alpha}{2}-\sin\frac{\alpha}{2})}{\sqrt{2+2\cos\alpha}}$.

2. $\dfrac{\cos 2\alpha}{\sqrt{2}\sin\alpha + \frac{\pi}{4}} = \dfrac{\sqrt{5}}{2} \quad \tan\alpha + \dfrac{1}{\tan\alpha}$.

3. $\tan\alpha = \dfrac{1}{3} \quad \dfrac{\cos 2\alpha}{(\sin\alpha - \cos\alpha)^2}$.

4. ABC $\sin A = -\sqrt{2}\cos B\cos C \quad \tan B \cdot \tan C = 1 - \sqrt{2}$ A .

5. OPQ 1 $\frac{\pi}{3}$ A PQ P Q A AB $\perp$ OP OP B A AC $\perp$ OQ OQ C $\angle$AOP $= \theta$ ACOB l θ l