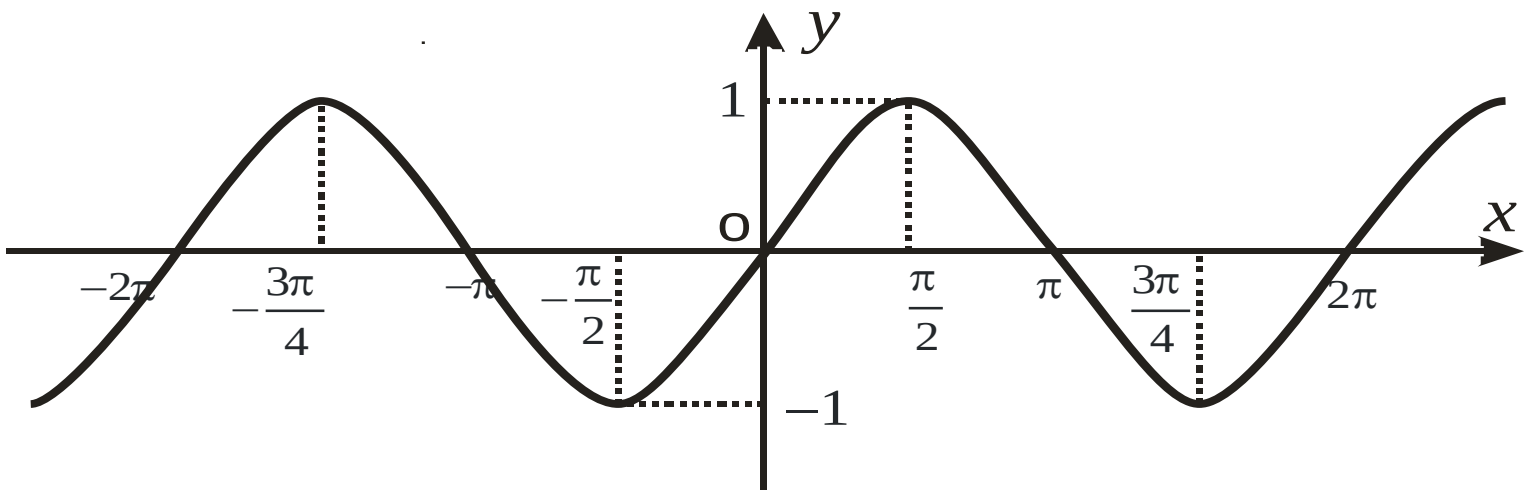
Trigonometrik funksiyalar grafiklari

1) $y = \sin x$ **funksiya.**

A.s. $x \in R$ yoki $x \in (-\infty; +\infty)$, Q.s. $-1 \le y \le 1$ yoki $y \in [-1;1]$



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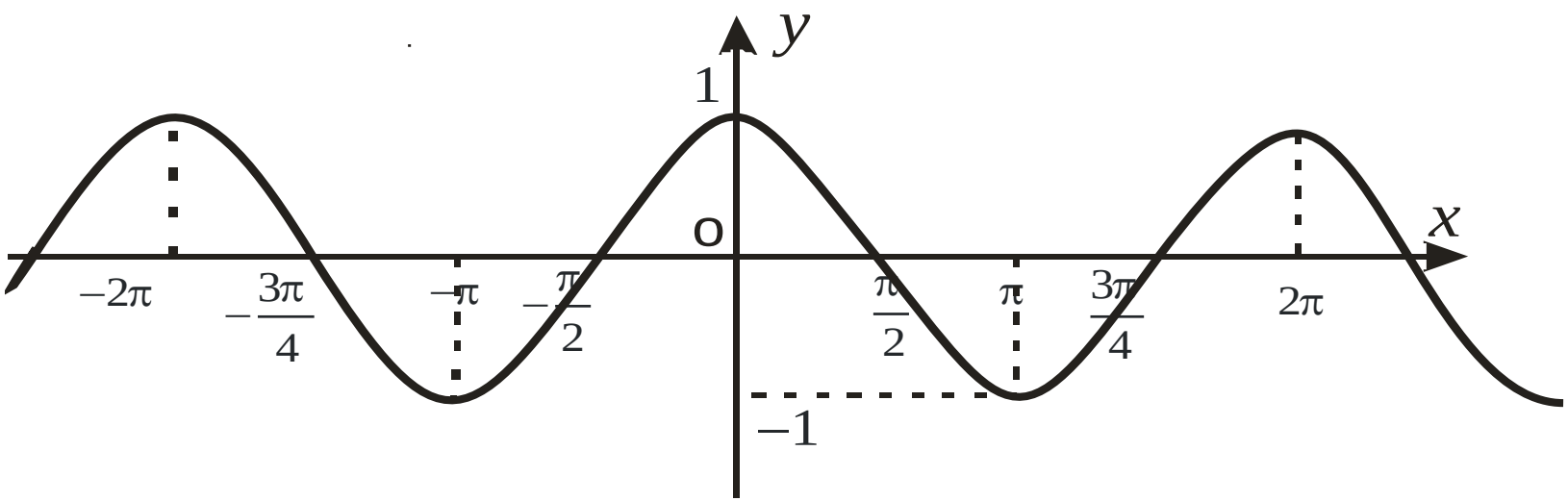
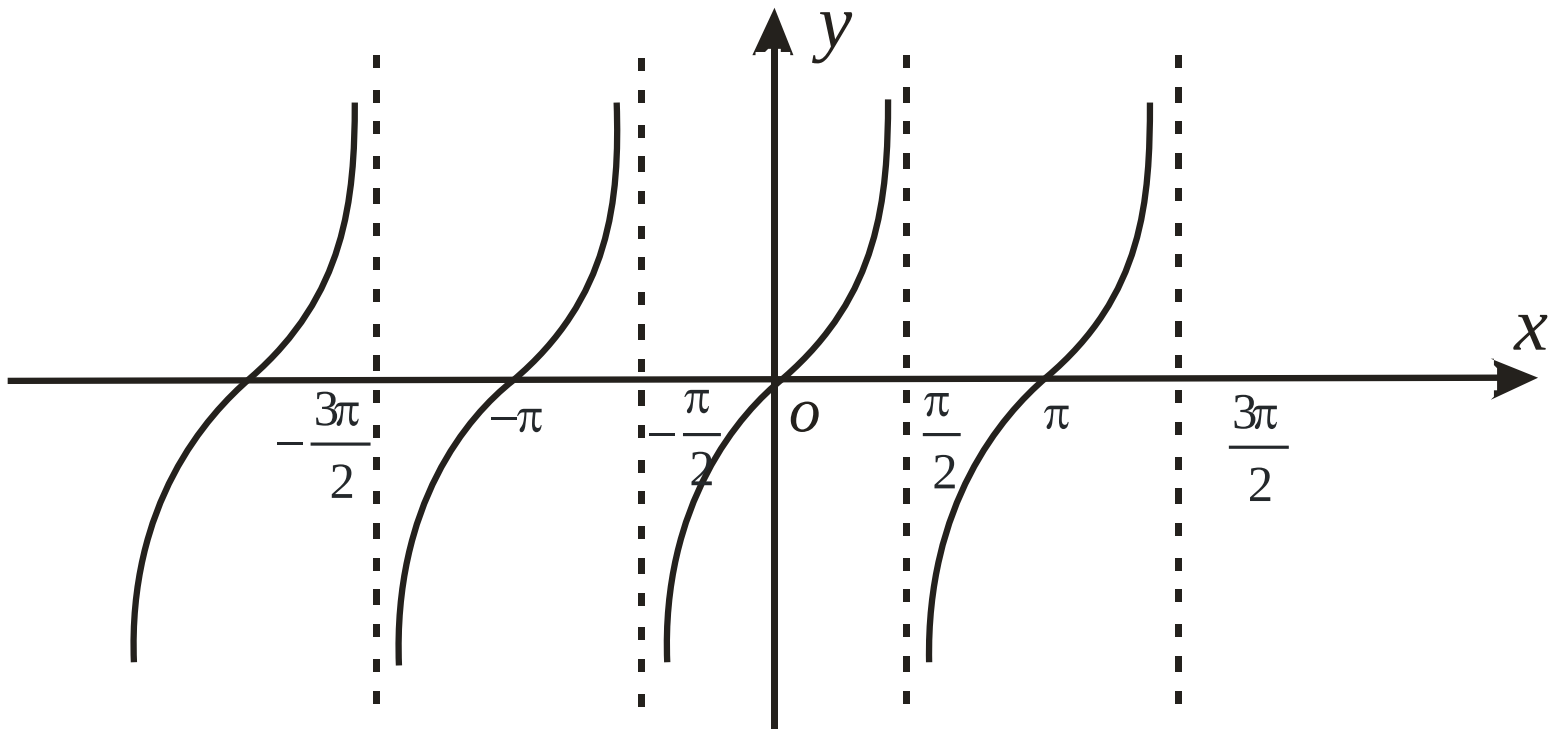


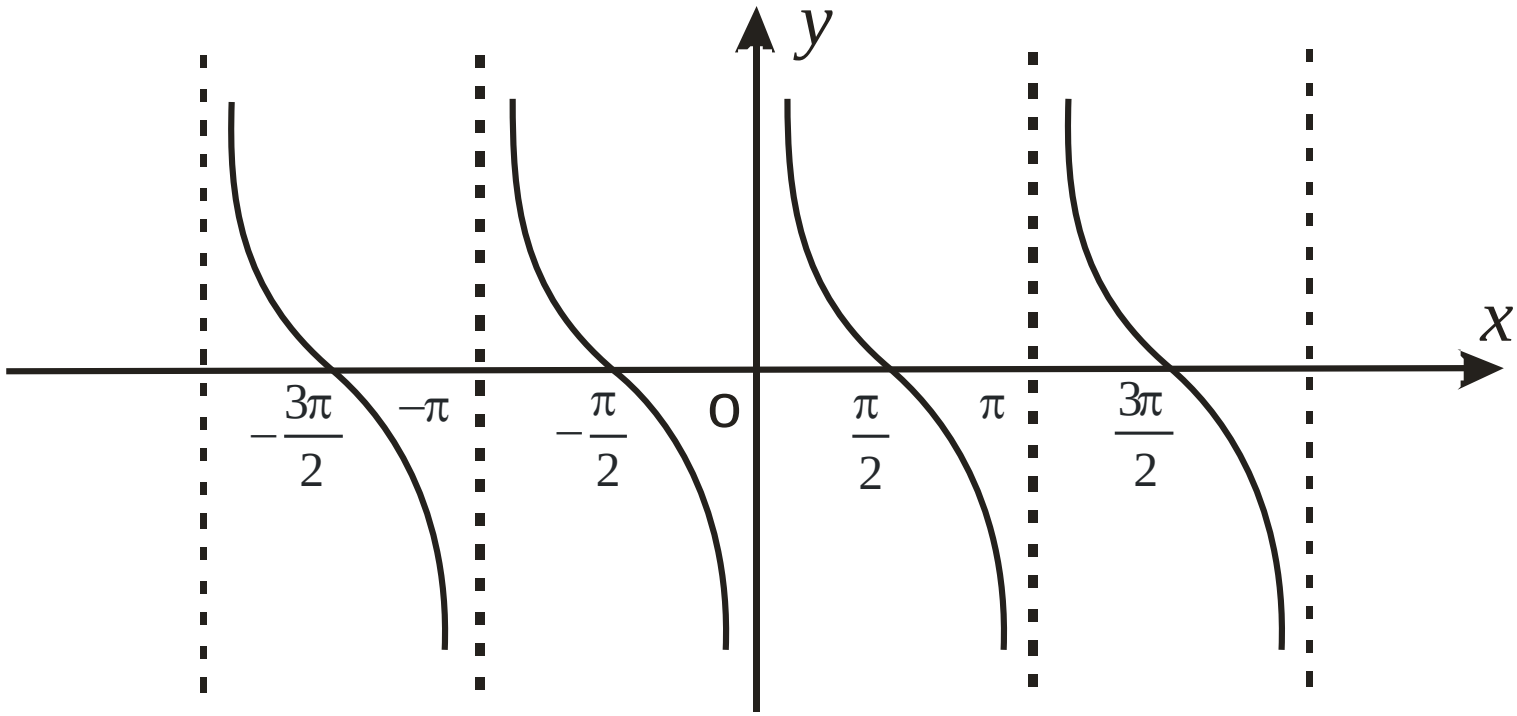
5) $y = tgx$

A.s. $x \neq \frac{\pi}{2} + \pi n,\ n \in Z$; Q.s. $y \in R$ yoki $y \in (-\infty; +\infty)$;



5) $y = ctgx$

A.s. $x \neq \pi n,\ n \in Z$; Q.s. $y \in R$ yoki $y \in (-\infty; +\infty)$;



1) $\sin\alpha \pm \sin\beta = 2\sin\frac{\alpha \pm \beta}{2} \cdot \cos\frac{\alpha \mp \beta}{2}$

2) $\sin\alpha + \cos\alpha = \sqrt{2}\cos(45^0 - \alpha) = \sqrt{2}\sin(45^0 + \alpha)$

3) $\cos\alpha - \sin\alpha = \sqrt{2}\sin(45^0 - \alpha) = \sqrt{2}\cos(45^0 + \alpha)$

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

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

6) $tg\alpha \pm tg\beta = \frac{\sin(\alpha \pm \beta)}{\cos\alpha \cdot \cos\beta}$

7) $ctg\alpha - ctg\beta = -\frac{\sin(\alpha - \beta)}{\sin\alpha \cdot \sin\beta}$

8) $ctg\alpha + ctg\beta = \frac{\sin(\alpha + \beta)}{\sin\alpha \cdot \sin\beta}$

9) $ctg\alpha - tg\beta = \frac{\cos(\alpha + \beta)}{\sin\alpha \cdot \cos\beta}$

10) $tg\alpha + ctg\beta = \frac{\cos(\alpha - \beta)}{\cos\alpha \cdot \sin\beta}$

12. Функциянинг энг катта ва энг кичик қийматини топинг:

1) $y=\cos^4 x-\sin^4 x;$ 2) $y=\sin\left(x+\frac{\pi}{4}\right)\sin\left(x-\frac{\pi}{4}\right);$

3) $y=1-2|\sin 3x|;$ 4) $y=\sin^2 x-2\cos^2 2x.$

13. Функциянинг энг катта ва энг кичик қийматини топинг:

1) $y=3\sin^2 x+2\cos^2 x;$ 2) $y=\cos^2 x-2\sin^2 x;$

3) $y=a\sin^2 x+b\cos^2 x.\ \ (a>b>0);$ 4) $y=12\sin^2 x+5\cos^2 x;$

5) $y=5-3\sin^2 x;$ 6) $y=3\cos^2 x-7\sin^2 x;$

7) $y=3/8+(5/8)\cos^2 x-\sin^2 x;$ 8) $y=0{,}28-0{,}28\cos^2 x-\sin^2 x;$

14. Функциянинг энг катта ва энг кичик қийматини топинг:

1) $y=2\cos 2x+\sin^2 x;$ 2) $y=\sin^2(\pi/4-x)+(\sin x-\cos x)^2;$

3) $y=\sin(x+\pi/4)\cdot\sin(x-\pi/4);$ 4) $y=\dfrac{1}{1+tgx\cdot tg2x};$

1. Ҳисобланг:

1) $\cos 105° + \cos 75°$; 2) $\sin 105° - \sin 75°$; 3) $\cos\frac{11\pi}{12} + \cos\frac{5\pi}{12}$;

4) $\cos\frac{11\pi}{12} - \cos\frac{5\pi}{12}$; 5) $\sin\frac{7\pi}{12} - \cos\frac{\pi}{12}$; 6) $\sin 105° + \sin 165°$.

2. Кўпайтма кўринишида ёзинг:

1) $\cos 22° + \cos 24° + \cos 26° + \cos 28°$; 2) $\cos\frac{\pi}{12} + \cos\frac{\pi}{4} + \cos\frac{5\pi}{6}$. .

3. Кўпайтма кўринишида ёзинг:

1) $\sin(\pi/10) + \sin(\pi/12)$; 2) $\sin 46° + \cos 50°$; 3) $\sin(\pi/10) - \cos(\pi/5)$;

4) $\cos(\pi/8) - \cos(\pi/18)$; 5) $tg(5\pi/24) - tg(7\pi/24)$; 6) $tg12° + ctg12°$;

7) $\sin 3a - \sin 5a$; 8) $\cos 36° - \sin 16°$; 9) $1 + \cos 18°$;

10) $1 - \sin(\pi/4)$; 11) $\cos(a+b) - \cos(a-b)$; 12) $1 + \cos 3a$;

13) $1 - \sin 2a$; 14) $1 + \sin x + \cos x$; 15) $\sin a - \sin(a - 60°)$;

16) $\sin \pi a + tg\pi a$; 17) $1 \pm tga$; 18) $\frac{1 - 2\cos a + \cos 2a}{1 + 2\cos a + \cos 2a}$;

19) $\frac{1 - 2\sin a - \cos 2a}{1 + 2\sin a - \cos 2a}$; 20) $\cos a + \sin 2a + \cos 3a + \sin 4a$; 21) $1 \pm ctgb$.

9. Айниятни исботланг:

1) $\frac{\sin a+\sin 3a}{\cos a+\cos 3a}=tg2a;$ 2) $\frac{\sin 2a+\sin 4a}{\cos 2a-\cos 4a}=ctga.$

3) $\cos^4 a-\sin^4 a+\sin 2a=\sqrt{2}\cos\left(2a-\frac{\pi}{4}\right);$ 4) $\cos a+\cos\left(\frac{2\pi}{3}+a\right)+\cos\left(\frac{2\pi}{3}-a\right)=0.$

5) $\frac{\sin 2a+\sin 5a-\sin 3a}{\cos a+1-2\sin^2 2a}=2\sin a;$ 6) $\frac{\sin a+\sin 3a+\sin 5a+\sin 7a}{\cos a-\cos 3a+\cos 5a-\cos 7a}=ctga.$

10. Ифодани соддалаштиринг:

1) $\frac{2(\cos a+\cos 3a)}{2\sin 2a+\sin 4a};$ 2) $\frac{1+\sin a-\cos 2a-\sin 3a}{2\sin^2 a+\sin a-1}.;$ 3) $\frac{\cos a-\cos 3a}{\sin a};$

4) $\frac{\cos 6a-\cos 4a}{\sin 5a}$ 5) $\cos^3 a\sin a-\sin^3 a\cos a;$ 6) $\frac{\sin a+\sin 2a}{1+\cos a+\cos 2a}.$

7) $\frac{\sin 2a-\sin 2a\cos 2a}{4\cos a};$ 8) $\frac{2\cos^2 2a}{\sin 4a\cos 4a+\sin 4a};$ 9) $\frac{\cos 2a+\sin 2a\cos 2a}{2\sin^2 a-1};$

10) $\frac{(\cos a-\sin a)^2}{\sin 2a\cos 2a-\cos 2a}.$ 11) $\frac{\cos^2 x}{1-\sin x}-\sin(\pi-x);$ 12) $\frac{\cos^2 x}{1+\sin x}+\cos(1{,}5\pi+x);$

13) $\frac{\sin^2 x}{1+\cos x}-\sin(1{,}5\pi+x);$ 14) $\frac{\sin^2 x}{1-\cos x}+\cos(3\pi-x).$