TRİGONOMETRİK FONKSİYON TÜREVİ

Aşağıdaki fonksiyonların türevini x değişkenine göre alınız.

1) $\sin x$

Cevap: $\cos x$

2) $\cos x$

Cevap: $-\sin x$

3) $\tan x$

Cevap: $\frac{1}{\cos^2 x}$

4) $\cot x$

Cevap: $-\frac{1}{\sin^2 x}$

5) $\sin(2x)$

Cevap: $2\cos 2x$

6) $\sin(3x)$

Cevap: $3\cos 3x$

7) $\sin(4x+2)$

Cevap: $4\cos(4x+2)$

8) $\sin(5x-4)$

Cevap: $5\cos(5x-4)$

9) $\sin(5x^2-3x)$

Cevap: $(10x-3)\cos(5x^2-3x)$

10) $\sin(4x^3-x^2+1)$

Cevap: $(12x^2-2x)\cos(4x^3-x^2+1)$

11) $\cos(x+1)$

Cevap: $-\sin(x+1)$

12) $\cos(x+4)$

Cevap: $-\sin(x+4)$

13) $\cos(2x-5)$

Cevap: $-2\sin(2x-5)$

14) $\cos(\pi\cdot x+20)$

Cevap: $-\pi\sin(\pi x+20)$

15) $\cos\left(\frac{x}{\pi}\right)$

Cevap: $-\frac{1}{\pi}\sin\left(\frac{x}{\pi}\right)$

16) $\cos(4x^2+x+5)$

Cevap: $(-8x-1)\sin(4x^2+x+5)$

17) $\tan(2x)$

Cevap: $\frac{2}{\cos^2 2x}$

18) $\tan\left(\frac{x}{3}\right)$

Cevap: $\frac{1}{3\cos^2\left(\frac{x}{3}\right)}$

19) $\tan\left(\frac{\pi}{x}\right)$

Cevap: $-\frac{\pi}{x^2\cdot\cos^2\left(\frac{\pi}{x}\right)}$

20) $\tan(x^3+x+1)$

Cevap: $\frac{3x^2+1}{\cos^2(x^2+x+1)}$

21) $\tan(2\pi x^4+\pi x^3+x^2+\pi)$

Cevap: $\frac{8\pi x^3+3\pi x^2+2x}{\cos^2(2\pi x^4+\pi x^3+x^2+\pi)}$

22) $\tan\left[(2x+1)\cdot(x^2+4x)\right]$

Cevap: $\frac{6x^2+18x+4}{\cos^2(2x^3+9x^2+4x)}$

23) $\cot(5x)$

Cevap: $-\frac{5}{\sin^2 5x}$

24) cot (4x+3)

Cevap: $-\frac{4}{\sin^2(4x+3)}$

25) cot (3x–2)

Cevap: $-\frac{3}{\sin^2(3x-2)}$

26) $\cot\left(\frac{1}{x}\right)$

Cevap: $\frac{1}{x^2\sin^2\left(\frac{1}{x}\right)}$

27) $\cot\left(\sqrt{x}\right)$

Cevap: $-\frac{1}{2\sqrt{x}\sin^2\sqrt{x}}$

28) sin (cosx)

Cevap: $-\cos(\cos x)\cdot\sin x$

29) sin (2 cosx)

Cevap: $-2\cos(2\cos x)\sin x$

30) $\sin\left(\tan\left(\frac{x}{2}\right)\right)$

Cevap: $\frac{1}{2}\cos\left[\tan\left(\frac{x}{2}\right)\right](1+\tan^2\frac{x}{2})$

31) cos (sinx)

Cevap: $-\sin(\sin x)\cos x$

32) cos (cos 3x)

Cevap: $3\sin(\cos 3x)\sin 3x$

33) $\cos(\cot(\pi\cdot x))$

Cevap: $\pi\sin(\cot(\pi x))\left(\frac{1}{\sin^2\pi x}\right)$

34) tan (sin(3x))

Cevap: $\frac{3\cos 3x}{\cos^2(\sin 3x)}$

35) tan (cosx.sinx)

Cevap: $\frac{\cos^2 x-\sin^2 x}{\cos^2(\cos x\sin x)}$

36) tan (cot2x)

Cevap: $\frac{-2}{\cos^2(\cot 2x)\sin^2(2x)}$

37) cot (sinx+cosx)

Cevap: $-\frac{\cos x-\sin x}{\sin^2(\sin x+\cos x)}$

38) $\cot\left(\cot\left(\frac{\pi}{x}\right)\right)$

Cevap: $\frac{-\pi}{x^2\sin^2\left(\cot\frac{\pi}{x}\right)\sin^2\left(\frac{\pi}{x}\right)}$

39) $\sin^2(x)$

Cevap: $\sin 2x$

40) $\sin^2(3x)$

Cevap: $3\sin 6x$

41) $\sin^4(\sin x)$

Cevap: $4\sin^3(\sin x)\cos(\sin x)\cos x$

42) $\cos^3(x)$

Cevap: $-3\cos^2 x\sin x$

43) $\cos^4(2x)$

Cevap: $-8\cos^3 2x\sin 2x$

44) $\cos^2(5x+4)$

Cevap: $-5\cos(10x+8)$

45) $\tan^2\left(\frac{x}{2}\right)$

Cevap: $\frac{\sin\frac{x}{2}}{\cos^3\frac{x}{2}}$

46) $\tan^3(\pi\cdot x)$

Cevap: $\frac{3\pi\sin^2(\pi x)}{\cos^4(\pi x)}$

47) $\cot^2(x+1)$

Cevap: $\frac{-2\cos(x+1)}{\sin^3(x+1)}$