1. $\lim_{x\to 0}\frac{1-\cos 2x}{\sin^2 3x}=\lim_{x\to 0}\frac{2.\sin 2x}{2.\sin 3x.\cos 3x}=\lim_{x\to 0}\frac{2\sin 2x}{\sin 6x}$

$=\lim_{x\to 0}\frac{2.2.\cos 2x}{6.\cos 6x}=\frac{4}{6}=\frac{2}{3}$

Cevap: C

2. $\lim_{x\to\frac{\pi}{2}}\frac{\ln(\sin x)}{(\pi-2x)^2}=\lim_{x\to\frac{\pi}{2}}\frac{\frac{\cos x}{\sin x}}{2(\pi-2x).(-2)}$

$=\lim_{x\to\frac{\pi}{2}}\frac{\cos x}{-4(\pi-2x).\sin x}$

$=\lim_{x\to\frac{\pi}{2}}\frac{-\sin x}{-4(-2).\sin x-4.\cos x.(\pi-2x)}$

$=\frac{-1}{-4(-2)}=-\frac{1}{8}$

Cevap: E

3. $\lim_{x\to\frac{\pi}{2}}(\pi-2x).\tan x=\lim_{x\to\frac{\pi}{2}}\frac{(\pi-2x).\sin x}{\cos x}$

$=\lim_{x\to\frac{\pi}{2}}\frac{-2.\sin x+\cos x(\pi-2x)}{-\sin x}=\frac{-2}{-1}=2$

Cevap: A

4. $\lim_{x\to 0}\frac{\sin^3(2x)}{x^3}=\left(\frac{2}{1}\right)^3=8$

Cevap: E

5. $\lim_{x\to 0^+}\frac{\sin x}{x+\sqrt{x}}=\frac{\text{sayı}}{0}=\infty$

Cevap: D

6. $\lim_{x\to\infty}\frac{x\ln x}{e^x-1}=\lim_{x\to\infty}\frac{\ln x+\frac{1}{x}\cdot x}{e^x}$

$=\lim_{x\to\infty}\frac{\ln x+1}{e^x}=\lim_{x\to\infty}\frac{\frac{1}{x}}{e^x}$

$=\lim_{x\to\infty}\frac{1}{x.e^x}=0$

Cevap: C

7. $\lim_{x\to 0}\frac{3x^2}{1-\cos ax}=\lim_{x\to 0}\frac{6x}{a.\sin ax}$

$=\lim_{x\to 0}\frac{6}{a^2.\cos ax}=\frac{6}{a^2}$

Cevap: C

8. $\lim_{x\to 0}\frac{x+2x.\cos x}{3.\sin x.\cos x}=\lim_{x\to 0}\frac{x+2x.\cos x}{3.\frac{\sin 2x}{2}}$

$\lim_{x\to 0}\frac{2x+4x.\cos x}{3.\sin 2x}=\lim_{x\to 0}\frac{2+4.\cos x-\sin x.4x}{3.2.\cos 2x}$

$=\frac{2+4}{6}=\frac{6}{6}=1$

Cevap: D

9. $\lim_{x\to 0}\frac{x-x\sin x.\cos x}{\sin x.\cos x}=\lim_{x\to 0}\left(\frac{x}{\sin x.\cos x}-x\right)$

$\lim_{x\to 0}\frac{x}{\sin x.\cos x}-\lim_{x\to 0}x$

$\lim_{x\to 0}\frac{1}{\cos x.\cos x-\sin x.\sin x}-0=\lim_{x\to 0}\frac{1}{\cos^2 x-\sin^2 x}$

$=1$

Cevap: D

10. $\lim\limits_{x\to 0}\dfrac{e^x-(1+x)}{x^2}=\dfrac{0}{0}$ "L'Hopital"

$\lim\limits_{x\to 0}\dfrac{e^x-1}{2x}=\lim\limits_{x\to 0}\dfrac{e^x}{2}=\dfrac{1}{2}$

Cevap: C

11. $\lim\limits_{x\to\infty}\dfrac{x+\cos x}{2x}=\lim\limits_{x\to\infty}\left(\dfrac{x}{2x}+\dfrac{\cos x}{2x}\right)$

$=\lim\limits_{x\to\infty}\dfrac{1}{2}+\lim\limits_{x\to\infty}\dfrac{\cos x}{2x}$

$=\dfrac{1}{2}+0=\dfrac{1}{2}$

Cevap: D

12. $\lim\limits_{x\to 0}\dfrac{\tan x}{3x^2-x}=\lim\limits_{x\to 0}\dfrac{1+\tan^2 x}{6x-1}=\dfrac{1+\tan^2 0}{6.0-1}$

$=\dfrac{1}{-1}=-1$

Cevap: A

13. $\lim\limits_{x\to -1}\dfrac{1-\cos 2(x+1)}{2(x+1)^2}=\dfrac{0}{0}$ "L'Hopital"

$\lim\limits_{x\to -1}\dfrac{2.\sin 2(x+1)}{4(x+1)}=\lim\limits_{x\to -1}\dfrac{4.\cos(x+1)}{4}=1$

Cevap: B

14. $\lim\limits_{x\to\infty}\dfrac{ax^2+4x-5}{cx+3}=\dfrac{1}{4}$

$a=0$

$\dfrac{4}{c}=\dfrac{1}{4}\Rightarrow c=16$ } $a+c=0+16=16$

Cevap: C

15. $\lim\limits_{x\to 2}\dfrac{f(x)-f(2)}{x-2}=f'(2)$

$f(x)=2x-\ln(2x)$

$f'(x)=2-\dfrac{2}{2x}=2-\dfrac{1}{x}$

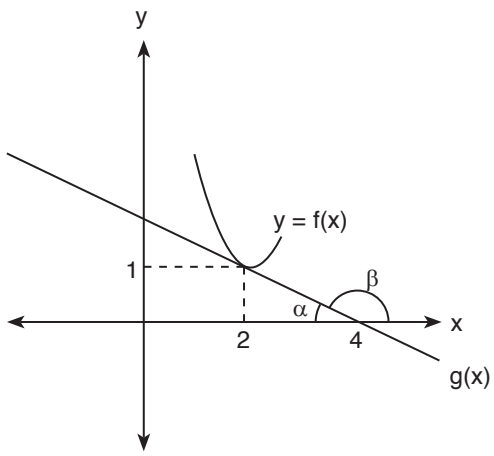
$f'(2)=2-\dfrac{1}{2}=\dfrac{3}{2}$

Cevap: A

16. $\lim\limits_{x\to 0}x.\cot 3x=\lim\limits_{x\to 0}x\cdot\dfrac{1}{\tan 3x}=\dfrac{1}{3}$

Cevap: E

17.



$f'(2) = m_{g(x)}$

$\tan\beta = m_{g(x)}$

$\alpha + \beta = 180 \quad \beta = 180 - \alpha$

$\tan\beta = \tan(180 - \alpha)$

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

$f'(2) = -\frac{1}{2}$ olur.

$\lim\limits_{x\to 1} \frac{f(x+1)-x}{x^2-1} = \frac{0}{0}$ "L'Hopital"

$\lim\limits_{x\to 1} \frac{f'(x+1)-1}{2x} = \frac{f'(2)-1}{2} = \frac{-\frac{1}{2}-1}{2}$

$= \frac{-\frac{3}{2}}{2} = -\frac{3}{4}$

Cevap: E

18. $\lim\limits_{x\to -2} \frac{\sin\pi x}{x^2-4} = \lim\limits_{x\to -2} \frac{\pi.\cos\pi x}{2x}$

$= \frac{\pi\cos(-2\pi)}{-4} = \frac{\pi.1}{-4} = -\frac{\pi}{4}$

Cevap: D

19. $\lim\limits_{x\to 0} \frac{x.\sin 2x}{\tan^2 3x} = \lim\limits_{x\to 0} \frac{x}{\tan 3x} \cdot \frac{\sin 2x}{\tan 3x} = \frac{1}{3} \cdot \frac{2}{3}$

$= \frac{2}{9}$

Cevap: B

20. $\lim\limits_{x\to \frac{\pi}{4}} \frac{1-\sqrt{2}.\sin x}{\cot 2x - 1} = \lim\limits_{x\to \frac{\pi}{4}} \frac{-\sqrt{2}.\cos x}{-2(1+\cot^2 2x)}$

$= \frac{-\sqrt{2}.\cos\frac{\pi}{4}}{-2\left(1+\cot^2\left(2\cdot\frac{\pi}{4}\right)\right)}$

$= \frac{-\sqrt{2}\cdot\frac{\sqrt{2}}{2}}{-2(1+0)} = \frac{-1}{-2} = \frac{1}{2}$

Cevap: D