1. If $\lim\limits_{x\to 3}\frac{x^n-3^n}{x-3}=108$ and $n\in N$, find n.

(1) 4
(2) 3
(3) 5
(4) 2

2. If $f(5)=7$ and $f'(5)=7$, then $\lim\limits_{x\to 5}\frac{xf(5)-5f(x)}{x-5}$ is equal to

(1) 35
(2) -35
(3) 28
(4) -28

3. $\lim\limits_{x\to-\infty}\frac{2x-1}{\sqrt{x^2+2x+1}}$ is equal to

(1) 2
(2) -2
(3) 1
(4) -1

4. $\lim\limits_{x\to 0}\frac{e^{\sin x}-1}{x}$ is equal to

(1) 0
(2) e
(3) 1
(4) Does not exist

5. $\lim\limits_{x\to 0}\frac{\log(1+3x^2)}{x(e^{5x}-1)}$ is equal to

Note: Assuming base of logarithm as e throughout.

(1) $\frac{3}{5}$
(2) $\frac{5}{3}$
(3) $\frac{-3}{5}$
(4) $\frac{-5}{3}$

6. $\lim\limits_{x\to 0}\frac{(1-\cos 2x)(3+\cos x)}{x\tan 4x}$ is equal to

(1) 4
(2) 3
(3) 2
(4) $\frac{1}{2}$

7. If $\lim\limits_{x\to 0}\frac{\log(3+x)-\log(3-x)}{x}=k$ then, the value of k is

(1) $-\frac{1}{3}$
(2) $\frac{2}{3}$
(3) $-\frac{2}{3}$
(4) 0

8. $\lim\limits_{x\to 2^+}\{x\}\frac{\sin(x-2)}{(x-2)^2}=$ (where $\{.\}$ denotes the fractional part of x).

(1) 0
(2) 1
(3) 2
(4) does not exist

9. $\lim\limits_{x\to-\infty}\frac{2x-1}{\sqrt{x^2+2x+1}}$ is equal to

(1) 2
(2) -2
(3) 1
(4) -1

10. $\lim\limits_{x\to 1}(1-x)\tan\left(\frac{\pi x}{2}\right)$ is equal to

(1) $\frac{\pi}{2}$
(2) π
(3) $\frac{2}{\pi}$
(4) 0