Find the following limits:

1. $\lim\limits_{x\to 0} \dfrac{\sin ax}{\sin bx}$

2. $\lim\limits_{x\to 1} (x-1)\log_x 2$

3. $\lim\limits_{x\to 1} \dfrac{x^m-1}{x^n-1}$ (m and n are natural numbers)

4. $\lim\limits_{x\to 0} \dfrac{(1+mx)^n-(1+nx)^m}{x^2}$ (m and n are natural numbers)

5. $\lim\limits_{x\to 1} \dfrac{x+x^2+\cdots+x^n-n}{x-1}$

6. $\lim\limits_{x\to\infty} \left(\sqrt{x+\sqrt{x+\sqrt{x}}}-\sqrt{x}\right)$

7. $\lim\limits_{x\to 0} \dfrac{\sqrt{x+\sqrt{x+\sqrt{x}}}}{x^{1/8}}$

8. $\lim\limits_{x\to 0} \dfrac{\sqrt{1+\tan x}-\sqrt{1+\sin x}}{x^3}$

9. $\lim\limits_{x\to 0} \dfrac{\sin\tan x-\tan\sin x}{\arcsin\arctan x-\arctan\arcsin x}$

10. $\lim\limits_{x\to 0} \dfrac{d^4}{dx^4}\left(\dfrac{x}{\sin x}\right)^3$