L'Hopital's Rule:	Suppose that f(a)=g(a)=0, that f & g are differentiable on an open interval containing a, and that g'(x) ≠ 0 on ; then $\lim_{x\to a}\frac{f(x)}{g(x)}=\lim_{x\to a}\frac{f'(x)}{g'(x)}$
Examples:	$\lim_{x\to 2}\frac{x^2-4}{x-2}=\frac{0}{0}\Rightarrow$ Use L'Hopital's Rule - Take derivative of numerator and denominator $\Rightarrow$ $\lim_{x\to 2}\frac{2x}{1}=\boxed{4}$
	$\lim_{x\to 1}\frac{x-1}{\sqrt{x}-1}=\frac{0}{0}\Rightarrow$ Use L'Hopitals: $\lim_{x\to 1}\frac{1}{\frac{1}{2\sqrt{x}}}=\lim_{x\to 1}\frac{2\sqrt{x}}{1}=\boxed{2}$
	$\lim_{x\to 2}\frac{x^2-4}{x+2}=\frac{0}{4}=\boxed{0}\Rightarrow$ You cannot use L'Hopital's Rule on this problem! Why??

Evaluate each Limit. Use L'Hopital's Rule where appropriate.

1	$\lim_{x\to 2}\frac{x^3-8}{x^2-4}$	2	$\lim_{x\to 0}\frac{\sin 5x}{x}$
3	$\lim_{x\to 2}\frac{\sqrt{2+x}-2}{x-2}$	4	$\lim_{x\to 1}\frac{\sqrt[3]{x}-1}{x-1}$
5	$\lim_{x\to 2}\frac{x^2-4x+4}{x^3-12x+16}$	6	$\lim_{x\to \frac{\pi}{2}}\frac{1-\sin x}{1+\cos 2x}$
7	$\lim_{x\to 1}\frac{x^3-1}{4x^3-x-3}$	8	$\lim_{x\to 3}\frac{x-4}{x-2}$

Find each derivative.

9	$f(x)=e^{\sqrt{x}}$	10	$y=e^{4\ln x}$
11	$y=\ln\lvert\sin x\rvert$	12	$y=\sqrt{4x^2+4x}$
13	$g(x)=\cos^3 5x$	14	$y=xe^{2x}$

15	Use a tangent line approximation to estimate the value of $\sqrt[3]{25}$.
16	For $f(x)=e^x$, use a tangent line approximation centered at $x=0$ to estimate $f(0.1)$.

Answers:

1) 3	2) 5	3) $\frac{1}{4}$	4) $\frac{1}{3}$
5) $\frac{1}{6}$	6) $\frac{1}{4}$	7) $\frac{3}{11}$	8) -1

9) $f'(x)=\frac{e^{\sqrt{x}}}{2\sqrt{x}}$	10) $y'=4x^3$	11) $y'=\cot x$	12) $y'=\frac{2x+1}{\sqrt{x^2+x}}$
13) $g'(x)=-15\cos^2 5x\sin 5x$	14) $y'=e^{2x}(2x+1)$	15) $\frac{79}{27}$	16) 1.1