L'Hopitals Rule 2 - show work on your own paper.

1. $\lim_{x\to 2}\dfrac{x^2-x-2}{x-2}$
2. $\lim_{x\to 0}\dfrac{e^x-(1-x)}{x}$
3. $\lim_{x\to 0^+}\dfrac{e^x-(1+x)}{x^3}$
4. $\lim_{x\to 0}\dfrac{\sin 2x}{\sin 3x}$
5. $\lim_{x\to -1}\dfrac{x^2-x-2}{x+1}$
6. $\lim_{x\to 1}\dfrac{\ln x^2}{x^2-1}$
7. $\lim_{x\to 0}\dfrac{\arcsin x}{x}$
8. $\lim_{x\to \infty}\dfrac{x^2}{e^x}$
9. $\lim_{x\to \pi}\dfrac{\sin x}{x-\pi}$
10. $\lim_{x\to \infty}\left(1+\dfrac{1}{x}\right)^x$
11. $\lim_{x\to \infty} x^{1/x}$
12. $\lim_{x\to 0}\dfrac{\arcsin 2x}{x}$
13. $\lim_{\theta\to 0}\dfrac{\tan\theta}{\theta}$
14. $\lim_{x\to 0^+}\dfrac{\cot x}{\ln x}$
15. $\lim_{x\to \infty} x\sin\left(\dfrac{\pi}{x}\right)$
16. $\lim_{x\to \infty}(1+x)^{\frac{1}{x}}$
17. $\lim_{x\to 0^+}(1+x)^{\frac{1}{x}}$
18. $\lim_{x\to \frac{\pi}{2}^-}(\cos x)^{\cos x}$

RECALL
Integrate

19. $\int \dfrac{dx}{3+16x^2}$
20. $\int \dfrac{dx}{x^2+2x+26}$
21. $\int \dfrac{(\ln x)^3}{x}\,dx$
22. Find the equation of the tangent line for $f(x)=2\arcsin\dfrac{x}{4}$ when x=2.

Find the derivative.

23. $f(x)=\dfrac{\arccos 2x}{x}$
24. $f(x)=\arctan\left(e^{2x}\right)$

Answers

1. 3
2. 2
3. ∞
4. 2/3
5. -3
6. 1
7. 1
8. 0
9. -1
10. e
11. 1
12. 2
13. 1
14. $-\infty$
15. π
16. 1
17. e
18. 1
19. $\dfrac{1}{4\sqrt{3}}\arctan\dfrac{4x}{\sqrt{3}}+C$
20. $\dfrac{1}{5}\arctan\dfrac{x+1}{5}+C$
21. $\dfrac{1}{4}(\ln x)^4+C$
22. $y-\dfrac{\pi}{3}=\dfrac{\sqrt{3}}{3}(x-2)$
23. $f'(x)=\dfrac{-2x-\left(\sqrt{1-4x^2}\right)\arccos 2x}{x^2\sqrt{1-4x^2}}$
24. $f'(x)=\dfrac{2e^{2x}}{1+e^{4x}}$