AP Calc Chapter 7 Review – All

Find the limit of each. Use L'Hopital if needed.

1. $\lim_{x\to 0}\frac{\sin 3x}{\sin 4x}$ 2. $\lim_{x\to 0}\frac{x-\sin x}{x^3}$ 3. $\lim_{x\to\infty}\frac{5x^3-4x^2+1}{7x^3+2x-6}$ 4. $\lim_{x\to\infty} xe^{-2x}$

Find the derivative of each.

5. $y = \ln^3 x$ 6. $f(x) = \frac{x^2}{\ln x}$ 7. $y = 3^{-2x}$ 8. $f(x) = \sin^{-1}(2x)$

9. $f(x) = 3\arccos(5x)$ 10. $f(x) = 4^{x-5}$

Integrate each.

11. $\int \frac{4}{\sqrt{25-x^2}}\,dx$ 12. $\int \frac{1}{36+4x^2}\,dx$ 13. $\int xe^{3x^2+1}\,dx$ 14. $\int 6^x\,dx$ 15. $\int \frac{e^x}{1+e^x}\,dx$

16. Find $(f^{-1})'(a)$ for $f(x) = \frac{2}{x} - e^x$ at a = 1.

17. The waitress pours coffee into your cup at 10:00 am. The coffee is 180^0 when freshly poured and after 2 minutes in a room at 70^0F, the coffee has cooled to 165^0F. Find the temperature at any time t and find the time at which the coffee is 120^0F.