Compute the following without calculators

1. $\ln(e^3)$

2. $e^{\ln(3)}$

3. $e^{(\ln 2 + \ln 3)}$

4. $\ln(e^4)$

5. $\ln(e^6)$

6. $e^{\ln(5)}$

7. $e^{\ln(7)}$

8. $e^{(\ln 5 + \ln 3)}$

Now take the derivatives of the following functions.

9. $f(x) = 3e^x$

10. $f(x) = e^{4x}$

11. $f(x) = \ln(3x)$

12. $f(x) = 3\ln(x)$

13. $f(x) = 12 e^{x}$

14. $f(x) = 4 e^{3x}$

15. $f(x) = 3 \ln(4x)$

16. $f(x) = 5 e^{6x}$

17. $f(x) = e^{(x^3 + 3x^2 + \sin(x))}$

18. $f(x) = \ln(3x^2 + 2x)$

19. $f(x) = \sin(e^x + 3x)$

20. $f(x) = \cos(e^x)$

21. $f(x) = e^{(\sin x + \cos x)}$

22. $f(x) = \ln(\cos x + x^2 - 2x)$

23. $f(x) = \cos(3x^2 + 2x + e^x)$

24. $f(x) = e^{(x^2 + 2x + \cos x)}$

25. $f(x) = \ln(e^x + 2x^2)$