Derivative Exam.

A. Find the derivative of each of the following:

1. $f(x) = 9$

2. $f(x) = 5x$

3. $f(x) = x^6$

4. $f(x) = 2x^{\frac{5}{3}}$

5. $f(x) = \dfrac{1}{x^4}$

6. $f(x) = \sqrt[5]{x^2}$

7. $f(x) = 5^x$

8. $f(x) = 3^{7x}$

9. $f(x) = e^{x^2}$

10. $f(x) = \ln x$

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

12. $f(x) = \log_4 x$

13. $f(x) = \sin(3x^2)$

14. $f(x) = \cos x^3$

15. $f(x) = \sin^3(x^2)$

B. Determine the first derivative

1. $f(x) = 5x^3 - 2x^2 + 5x - 3$

2. $f(x) = (\ln(3x^2 - 5))^3$

3. $f(x) = 7^{5x^3 - 3x + 6}$

4. $f(x) = \log_9(6x^5 - 7x)$

5. $f(x) = e^{5x-7}$

6. $f(x) = (\cos(6x^3 - 2x + 1))^3$

7. $f(x) = \ln(\sin(5^{3x+2}))$

8. $f(x) = \ln(3x)e^{4x}$

9. $f(x) = \log_3 x^2 \sin(5x)$

10. $f(x) = (4x^3 + 5)^{\frac{1}{3}}(3x - 7)^4$

11. $f(x) = \dfrac{(5x - 1)^3}{(7x + 2)^4}$

12. $f(x) = 6^{2x}(\ln x + x^2)^{-6}$

Use the Quotient Rule

13. $f(x) = \dfrac{\ln x^2}{\sin x}$

14. $f(x) = \dfrac{e^{x^3}}{(3x - 1)^3}$