Kerry Ojakian's MTH 31 Class
Class Assignment #6

For the following exercises, find $f'(x)$ for each function.

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

2. $f(x) = 4x^2$

3. $f(x) = 34$

4. $f(x) = 2x^7 + x^4$

5. $f(x) = -4x^5 - 2x$

6. $f(x) = x$

7. $f(x) = x^2(x + 3)$

8. $f(x) = (x^2 + 2x)(x + 1)$

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

10. $f(x) = x^{-3}$

11. $f(x) = 4x^{-2}$

12. $f(x) = -2x^{-5}$

13. $f(x) = \dfrac{3}{x^2}$

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

15. $f(x) = x^5\left(x^5 + \dfrac{1}{x^5}\right)$

16. $f(x) = \dfrac{x}{x + 1}$

17. $f(x) = 4\sqrt{x}$

18. $f(x) = 4x^{5/2}$

19. $f(x) = 6x^{1/2}$

20. $f(x) = 3x^{-1/2}$

21. $f(x) = \sqrt{x}(x^2 + x)$

For the following exercises, find $f''(x)$ for each function.

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

23. $f(x) = 5x$

24. $f(x) = 10\sqrt{x}$

25. $f(x) = 54$

26. $f(x) = 3x^2 - x + 25$

27. $f(x) = \dfrac{2}{x} + x^{-2}$

For the following exercises, find $f'(x)$ for each function.

28. $f(x) = 35\sin(x)$

29. $f(x) = 20\cos(x)$

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

31. $f(x) = 32e^x$

32. $f(x) = 3\ln(x) - \cos(x)$

33. $f(x) = x + \cos(x) - 3\sin(x)$

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

35. $f(x) = \log_5(x)$

36. Find the equation of the tangent line to the graph of $g(x) = x^2 + 6$ at $x = 1$.

37. Find the equation of the tangent line to the graph of $g(x) = \dfrac{3}{x}$ at $x = -1$

38. Determine all points on the graph of $g(x) = 7x^2 - 5x + 2$ for which the tangent line is horizontal.

39. Determine all points on the graph of $g(x) = 2x^3 + x^2 - 3x + 1$ for which the tangent line is horizontal.

40. Find the point on the graph of $h(x) = x^2$ such that the tangent line at that point has an x intercept of -3.

41. Find the point on the graph of $h(x) = x^3$ such that the tangent line at that point has an y intercept of -4.