# Homework Math 140
# Lecture 8, 9,10
# Will be Quizzed on March 28



**Problem 1** *(Textbook, page 136, 1-44). Compute the derivative.*

1. $f(x) = 2^{40}$.
2. $f(x) = \pi^2$.
3. $f(t) = 2 - \frac{2}{3}t$.
4. $F(x) = \frac{3}{4}x^8$.
5. $f(x) = x^3 - 4x + 6$.
6. $f(t) = \frac{1}{2}t^6 - 3t^4 + t$.
7. $g(x) = x^2(1 - 2x)$.
8. $h(x) = (x - 2)(2x + 3)$.
9. $g(t) = 2t^{-3/4}$.
10. $B(y) = cy^{-6}$.
11. $A(s) = -\frac{12}{s^5}$.
12. $y = x^{5/3} - x^{2/3}$.
13. $S(p) = \sqrt{p} - p$.
14. $y = \sqrt{x}(x - 1)$.
15. $R(a) = (3a + 1)^2$.
16. $S(R) = 4\pi R^2$.
17. $y = \frac{x^2+4x+3}{\sqrt{x}}$.
18. $y = \frac{\sqrt{x}+x}{x^2}$.
19. $H(x) = (x + x^{-1})^3$.
20. $g(u) = \sqrt{2}u + \sqrt{3u}$.
21. $u = \sqrt[5]{t} + 4\sqrt{t^5}$.
22. $v = \left(\sqrt{x} + \frac{1}{\sqrt[3]{x}}\right)^2$.
23. $f(x) = (1 + 2x^2)(x - x^2)$.
24. $f(x) = \frac{x^4-5x^3+\sqrt{x}}{x^2}$.
25. $V(x) = (2x^3 + 3)(x^4 - 2x)$.
26. $L(x) = (1 + x + x^2)(2 - x^4)$.
27. $F(y) = \left(\frac{1}{y^2} - \frac{3}{y^4}\right)(y + 5y^3)$.
28. $J(v) = (v^3 - 2v)(v^{-4} + v^{-2})$.
29. $g(x) = \frac{1+2x}{3=4x}$.
30. $f(x) = \frac{x-3}{x+3}$.
31. $y = \frac{x^3}{1-x^2}$.
32. $y = \frac{x+1}{x^3+x-2}$.
33. $y = \frac{v^3-2v\sqrt{v}}{v}$.
34. $y = \frac{t}{(t-1)^2}$.
35. $y = \frac{t^2+2}{t^4-3t^2+1}$.
36. $g(t) = \frac{t-\sqrt{t}}{t^{1/3}}$.
37. $y = ax^2 + bx + c$.
38. $y = A + \frac{B}{x} + \frac{C}{x^2}$.
39. $f(t) = \frac{2t}{2+\sqrt{t}}$.
40. $y = \frac{cx}{1+cx}$.
41. $y = \sqrt[3]{t}(t^2 + t + t^{-1})$.
42. $y = \frac{u^6-2u^3+5}{u^2}$.
43. $f(x) = \frac{x}{x+\frac{c}{x}}$.
44. $f(x) = \frac{ax+b}{cx+d}$.

**Problem 2** *(Textbook, page 146, problems 1-19). Compute the derivative.*

1. $f(x) = 3x^2 - 2\cos x$.
2. $f(x) = \sqrt{x}\sin x$.
3. $f(x) = \sin x + \frac{1}{2}\cot x$.
4. $y = 2\sec x - \csc x$.
5. $y = \sec\theta\tan\theta$.
6. $g(t) = 4\sec t + \tan t$.
7. $y = c\cos t + t^2\sin t$.
8. $y = u(a\cos u + b\cot u)$.
9. $y = \frac{x}{2-\tan x}$.
10. $y = \sin\theta\cos\theta$.
11. $f(\theta) = \frac{\sec\theta}{1+\sec\theta}$.
12. $y = \frac{\cos x}{1-\sin x}$.
13. $y = \frac{t\sin t}{1+t}$.
14. $y = \frac{1-\sec x}{\tan x}$.
15. $h(\theta) = \theta\csc\theta - \cot\theta$.
16. $y = x^2\sin x\tan x$.
17. $f(x) = \csc x$.
18. $f(x) = \sec x$.
19. $f(x) = \cot x$.