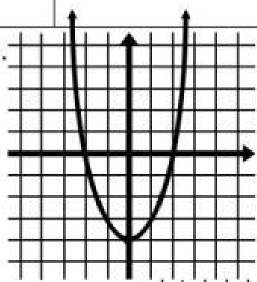
Basic Derivatives Practice Worksheet

Try your best on this and finish it for homework. We will go over the solutions and I will check for completeness next week.

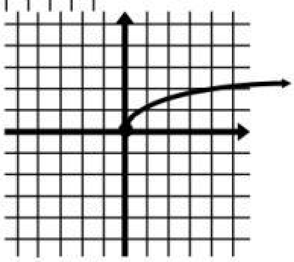
Rewrite each function, differentiate, and then simplify (no negative exponents!)

Function	Rewrite	Differentiate	Simplify
A. $y=\dfrac{5}{2x^3}$			
B. $y=\dfrac{5}{(2x)^3}$			
C. $y=\dfrac{7}{3x^{-2}}$			
D. $y=\sqrt[6]{x}$			
E. $y=\dfrac{1}{x^2}+\dfrac{1}{x^3}$			
F. $y=\dfrac{2}{\sqrt[3]{x}}-\dfrac{3}{x^2}$			

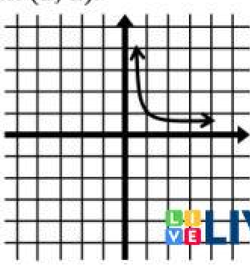
G. Find the equation of the line tangent to $y=x^2-4$ at the point (1, -3).



H. Find the equation of the line tangent to $y=\sqrt{x}$ at the point (4, 2).



I. Find the equation of the line tangent to $y=x^{-\frac{1}{2}}$ at the point (1, 1).



The Constant Rule	**The Power Rule**
The derivative of a constant function is zero. $\frac{d}{dx}[c]=0$	If n is a rational number, then the function $f(x) = x^n$ is differentiable and… $\frac{d}{dx}\left[x^n\right]=n\cdot x^{n-1}$
The Constant Multiple Rule	**The Sum and Difference Rules**
If f is a differentiable function and c is a real number, then $c\cdot f$ is differentiable and… $\frac{d}{dx}\left[c\cdot f(x)\right]=c\cdot f'(x)$	The sum (or difference) of two differentiable functions, f and g, is differentiable and… $\frac{d}{dx}\left[f(x)\pm g(x)\right]=f'(x)\pm g'(x)$

Use an applicable rule to find each derivative.

1. $f(x)=x^5-2x^3+7x-12$	2. $g(x)=3x^2+2x+1$	3. $s(t)=-16t^2+70t+500$
4. $y=\frac{2}{x}$	5. $y=2\sqrt{x}$	6. $y=\frac{4x^2}{5}$
7. $y=-\frac{3}{2}x$	8. $y=\frac{1}{2\sqrt[3]{x^2}}$	9. $f(x)=x^3-4x+5$
10. $g(x)=-\frac{x^4}{2}+3x^3-2x$	11. $h(x)=\sqrt[5]{x}-\sqrt[4]{x}-\frac{1}{x^{\frac{2}{3}}}$	12. $f(x)=-\frac{1}{2}+\frac{7}{5}x^2$
13. $f(x)=x^2+5-3x^{-2}$	14. $h(s)=s^{\frac{4}{5}}-s^{\frac{2}{3}}$	15. $F(T)=T^{\frac{2}{3}}-T^{\frac{1}{3}}+4$
16. $y=3x(6x-5x^2)$	17. $f(x)=\frac{x^3-3x^2+4}{x^2}$	18. $h(x)=\frac{2x^2-3x+1}{x}$