AP Calculus   **Gateway 3A   Derivatives**   Name_____

1 2 3 4 5 6 7

Differentiate, assuming k is a constant. Simplify completely. Do not leave negative exponents.

1. $y = \dfrac{3x^2}{x-1}$ (Simplify completely at end)

2. $y = 2^{3x} \cdot 2x$ (Factor completely at end)

3. $y = \cos^4\left(e^{kx}\right)$

4. $y = \ln\left(x^2 - 4x\right)$

5. $y = -3\arcsin\left(2x^2\right)$

6. $y = 3x^\pi - e^{\ln x^2} + 5e^2 - x^k + k^k$

7. $y = \tan^{-1}\left(5 - 5x^2\right)$

8. $y = e^{3x} \cdot 3x^2$

9. $y = \dfrac{5 - x}{5 + x^2}$

10. $y = \sqrt{1 + 2x + x^3}$