Name: _____ Date: _____

AP Calculus AB: Separable Differential Equations Ms. Loughran

Do Now:

1. $\int \frac{\sin x}{\cos^2 x} dx =$

Differential equation:

We can solve differential equations using a technique called separation of variables. You move different variables to opposite sides of the equation so that you can integrate both sides of the equation separately.

1. Solve for y if $\frac{dy}{dx} = (xy)^2$ and $y = 1$ when $x = 1$.

You can check by taking the derivative.

For each of the following, solve for y.

2. $\frac{dy}{dx} = \frac{x}{y}$ and $y = 2$ when $x = 1$.

3. $\frac{dy}{dx} = \frac{y}{x}$ and $y = 2$ when $x = 2$.

4. $\frac{dy}{dx} = -2xy^2$ and $y = .25$ when $x = 1$.

5. $\frac{dy}{dx} = (\cos x)e^{y+\sin x}$ and $y = 0$ when $x = 0$.

6. $\frac{dy}{dx} = (y+5)(x+2)$ and $y = 1$ when $x = 0$.