

AP Calculus – Differential Equations

Find the general solution to the following differential equations, then find the particular solution using the initial condition. Remember you may need to rewrite the expression in order to separate your x and y factors.

1. $\frac{dy}{dx} = \frac{x}{y}$, $y(1) = -2$

2. $\frac{dy}{dx} = -\frac{x}{y}$, $y(4) = 3$

3. $\frac{dy}{dx} = \frac{y}{x}$, $y(2) = 2$

4. $\frac{dy}{dx} = 2xy$, $y(0) = -3$

5. $\frac{dy}{dx} = xy + 5x + 2y + 10$, $y(0) = -1$

6. $\frac{dy}{dx} = \cos^2 y$, $y(0) = 0$

7. $\frac{dy}{dx} = -2xy^2$, $y(1) = \frac{1}{4}$

8. $\frac{dy}{dx} = \frac{4\sqrt{y}\ln x}{x}$, $y(e) = 1$

9. $\frac{dy}{dx} = e^{x-y}$, $y(0) = 2$

10. $(\sec x) \frac{dy}{dx} = e^{y+\sin x}$, $y(0) = 0$