In problems 1 – 8 find the general solution to the differential equation.

1. $\frac{dy}{dx} = kx$

2. $\frac{dy}{dx} = ky$

3. $\frac{dy}{dx} = x^2 + k^2$

4. $\frac{dy}{dx} = y^2 + k^2$

5. $\frac{dy}{dx} = y + ky$

6. $\frac{dy}{dx} = y + k$

7. $\frac{dy}{dx} = kx - x$

8. $\frac{dy}{dx} = ky(x - 1)$

In problems 9 – 10, solve the initial value problem:

9. $\frac{dy}{dx} = \frac{x(y-2)}{x^2+4}$ $\quad y(1) = 5$

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