

33 (a) $F = 2x^2 + y^2$

$$F = K$$

$$F = 2x^2 + y^2 = K$$

$$dF = 0 = 4x dx + 2y dy$$

$$-2y dy = 4x dx$$

$$\frac{dy}{dx} = -\frac{4x}{2y}$$

Take, the negative reciprocal

$$\text{slope} = \frac{2y}{4x}, \text{ so}$$

$$\frac{dy}{dx} = \frac{2y}{4x}$$

$$\frac{dy}{y} = \frac{dx}{2x}$$

$$\ln y + C = \frac{1}{2} \ln x$$

$$Cy^2 = x$$