

**Separable Differential Equations****Linear Approximations:** Find the linear approximation for  $f(1.3)$ .

1.  $\frac{dy}{dx} = 2x, (1,3)$ .

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

**Separable Differential Equations:** Find the original function.

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

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

**Separable Differential Equations:** Find the initial value function.

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

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