$y = e^x$

$y = 2^x$

$y = x^2$

$y = 3^2 = 9$

$$y = x^3$$

$$y = 8$$

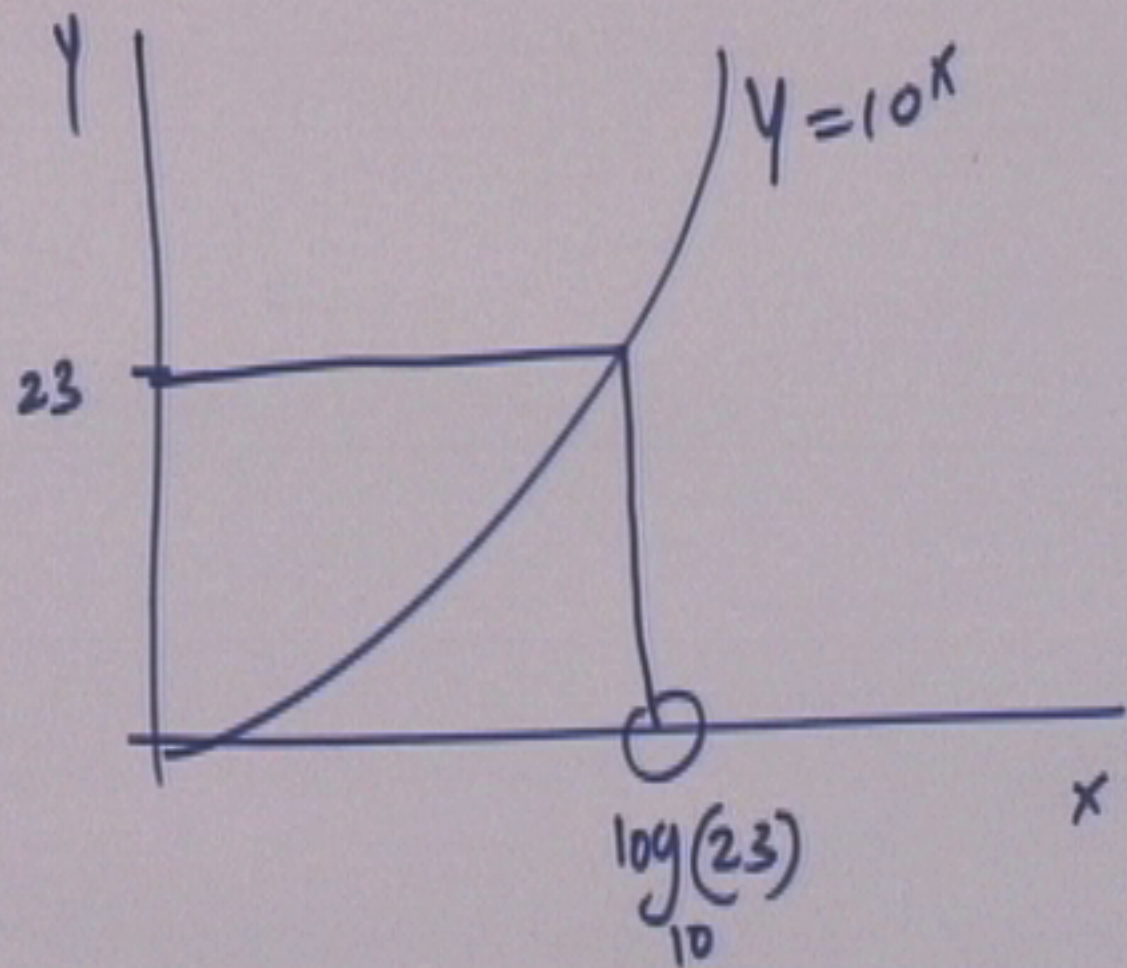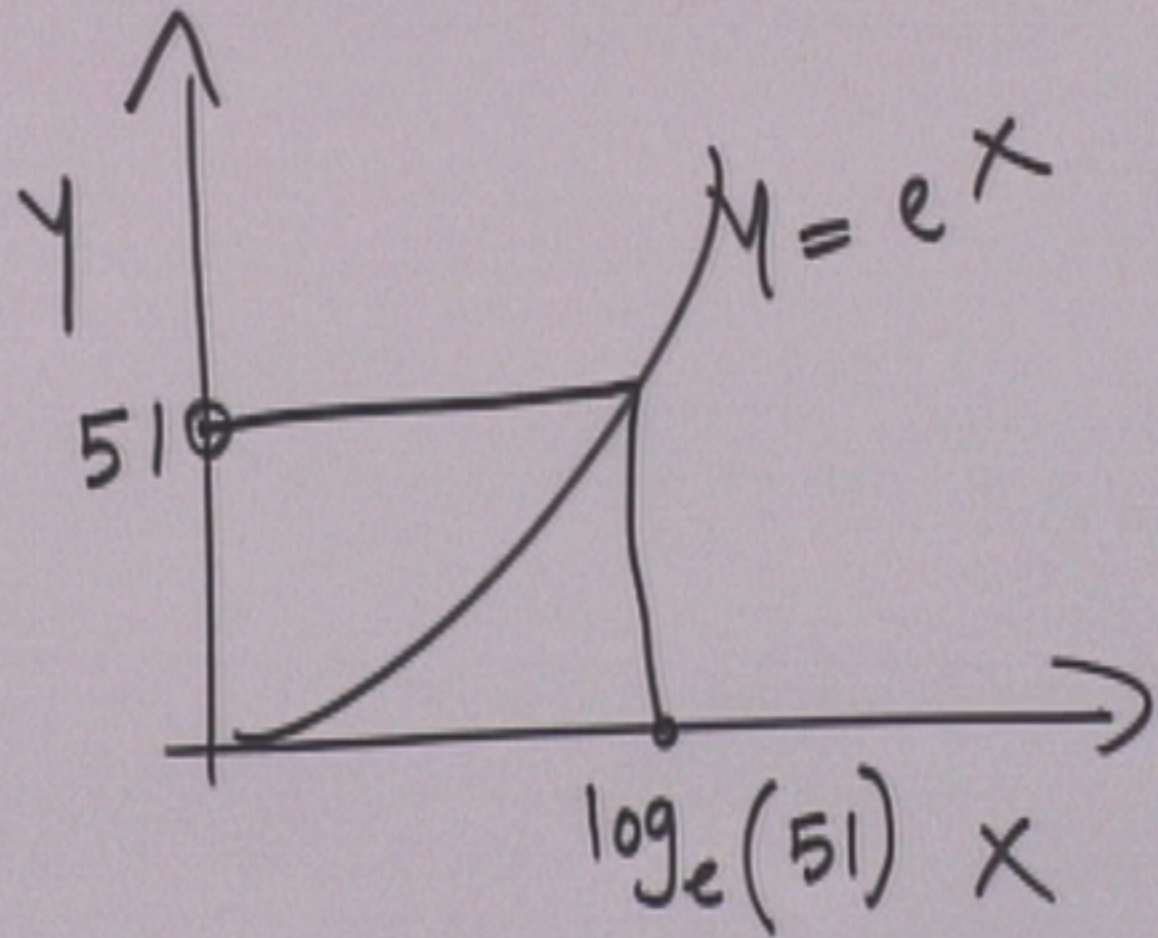$$\Rightarrow x = \sqrt[3]{8} = 8^{1/3} = 2$$

$$y = 10^x$$

If $\boxed{x = 1}$

$$y = 10^1 = \boxed{10}$$

If $\boxed{x = 2}$

$$y = 10^2 = \boxed{100}$$

$$\log_{10}(100) = 2$$

Y

$Y = 10^x$

23

$\log_{10}(23)$

X

Y

$y = e^x$

51

$\log_e(51)$ X
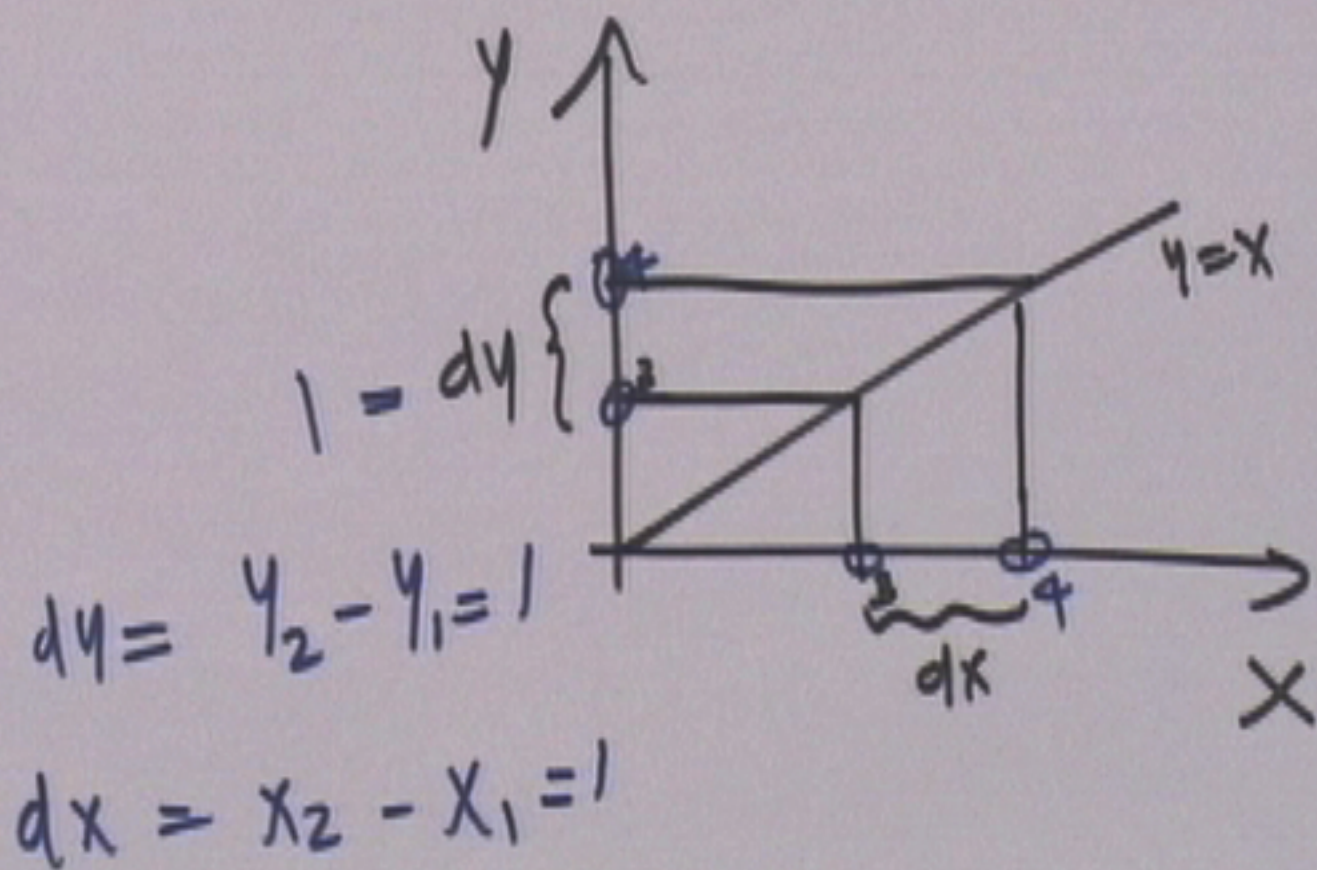
$$\log(10) = 1$$

$$\log(100) = 2$$

$$\log(1000) = 3$$

$$\log(10000) = 4$$

$$\log(10^5) = 5$$

$$\log(10^6) = 6$$

$$X_1 = 3 \qquad Y_1 = 3$$

$$X_2 = 4 \qquad Y_2 = 4$$

$$y = x$$

$$1 = dy$$

$$dy = Y_2 - Y_1 = 1$$

$$dx = X_2 - X_1 = 1$$

$$\text{If } y = x$$

$$dy = dx$$

$$\Rightarrow \frac{dy}{dx} = 1$$

derivative of

$$y = x \quad \text{curve}$$
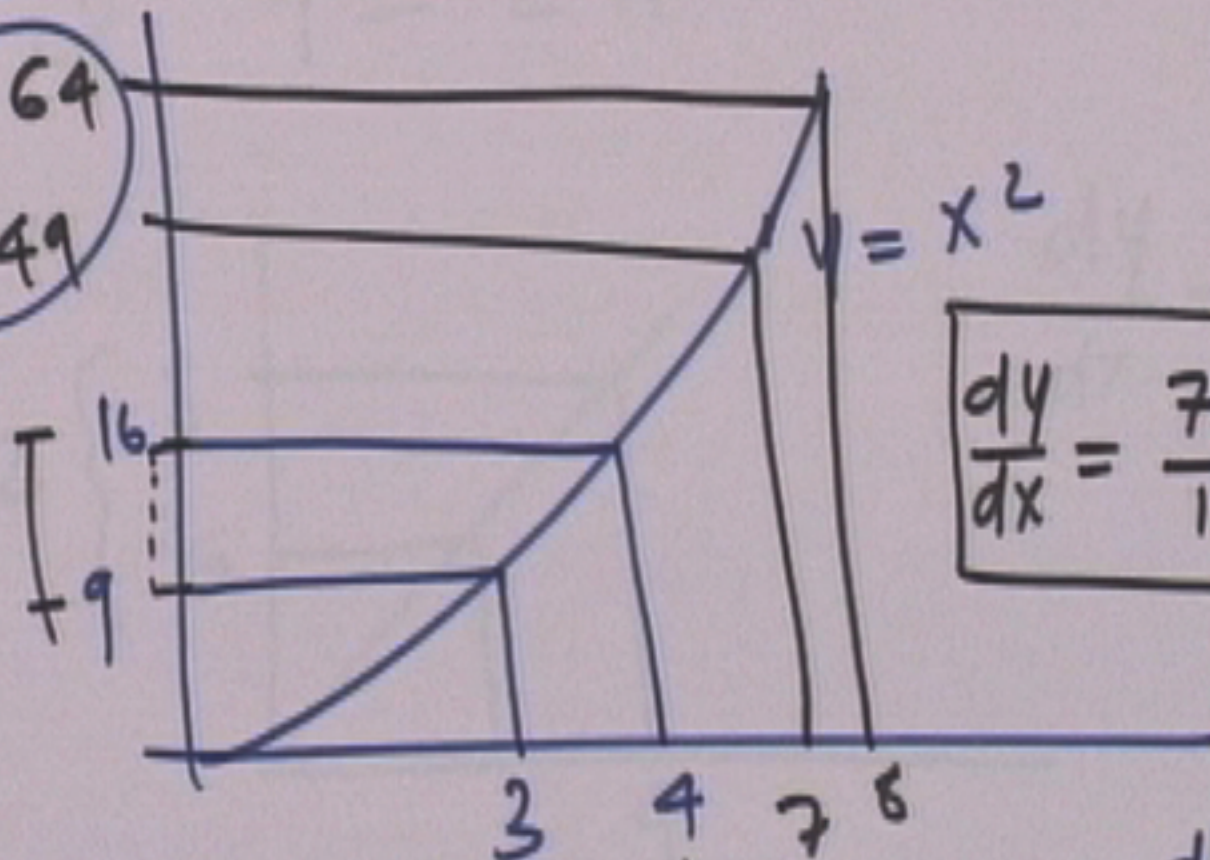
is 1

For $y = 2x$

$dy = 8 - 6 = 2 \begin{cases} 8 \\ 6 \end{cases}$

$\dfrac{dy}{dx} = \dfrac{8-6}{4-3} = \dfrac{2}{1}$

$= 2$

3 4

$dx = 4 - 3 = 1$

$$\boxed{5} \begin{array}{|l} 64 \\ 49 \end{array}$$

$\dfrac{dy}{dx} = x^2$

$\dfrac{dy}{dx} = 16 - 9$

$= \dfrac{7}{1}$

$\boxed{\dfrac{dy}{dx} = \dfrac{7}{1} = \boxed{7}}$

a

3 4 7 8

$dx = 4 - 3 = \underline{1}$

$\dfrac{dy}{dx} = \boxed{\dfrac{15}{1}}$ is

Slope of $y = x^2$ curve

increases with x

slope $\propto x$