

$$\textcircled{21} \quad y = Ce^{kx}$$

$$(0, 6)$$

↓

$$6 = Ce^0$$

$$6 = C$$

$$(4, 15)$$

↓

$$15 = 6e^{4k}$$

$$\frac{15}{6} = e^{4k}$$

$$\ln\left(\frac{5}{2}\right) = \ln(e^{4k})$$

$$\frac{1}{4}\ln\left(\frac{5}{2}\right) = k$$

$$(8, \quad)$$

$$y = 6e^{\left(\frac{1}{4}\ln\frac{5}{2}\right)x}$$

$$y = 6e^{2\ln\frac{5}{2}}$$

$$y = 6e^{\ln\frac{25}{4}}$$

$$= 6\left(\frac{25}{4}\right) = \frac{75}{2}$$

$$y = 6e^{\frac{1}{4} \ln \frac{5}{2} x}$$

$$y = 6e^{(\ln \frac{5}{2})(\frac{1}{4}x)}$$

$$y = 6\left(\frac{5}{2}\right)^{x/4}$$

$$(X^2)^3 = X^{2 \cdot 3}$$

$$23.) V = Ce^{kt} \quad V = 20,000 e^{(\frac{1}{4} \ln \frac{5}{3})(6)}$$

$$(0, 20,000) \rightarrow C = 20,000$$

$$(4, 12,500)$$

$$12500 = 20,000 e^{4k}$$

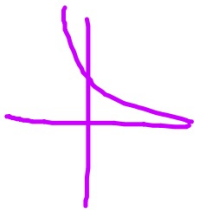
$$\frac{125}{200} = e^{4k}$$

$$\frac{5}{8} = e^{4k}$$

$$\ln \frac{5}{8} = \ln e^{4k}$$

$$\ln \frac{5}{8} = 4k$$

$$\frac{1}{4} \ln \left( \frac{5}{8} \right) = k$$



$$17.) \frac{dy}{dt} = \frac{1}{2}t$$

$$(0, 10)$$

$$\int dy = \int \frac{1}{2}t dt$$

$$y = \frac{1}{2} \cdot \frac{t^2}{2} + C$$

$$y = \frac{t^2}{4} + 10$$

$$y = \frac{t^2}{4} + C$$

$$10 = C$$

$$19.) \frac{dy}{dt} = -\frac{1}{2}y$$

$$\int \frac{dy}{y} = \int -\frac{1}{2} dt$$

$$(0,10) \quad \ln|y| = -\frac{1}{2}t + C$$

$$\ln 10 = C$$

$$e^{\ln|y|} = e^{-\frac{1}{2}t + \ln 10}$$

$$y = e^{-\frac{1}{2}t} \cdot e^{\ln 10}$$

$$y = 10e^{-\frac{1}{2}t}$$

27.) (1, 5) (5, 2)

$$5 = Ce^k$$

$$5e^{\frac{5}{k}} = C$$

$$e^{\frac{5}{4 \ln 5}} = C$$

$$\frac{5}{\left(\frac{2}{5}\right)^{1/4}} = C$$

$$2 = Ce^{5k}$$

$$2 = \frac{5}{e^k} e^{5k}$$

$$2 = 5e^{4k}$$

$$\frac{2}{5} = e^{4k}$$

$$\frac{1}{4} \ln \frac{2}{5} = k$$

$$y = \frac{5}{\left(\frac{2}{5}\right)^{1/4}} e^{\frac{1}{4} \ln \frac{2}{5} t}$$

$$y = \frac{5}{\left(\frac{2}{5}\right)^{1/4}} \left(\frac{2}{5}\right)^{t/4}$$