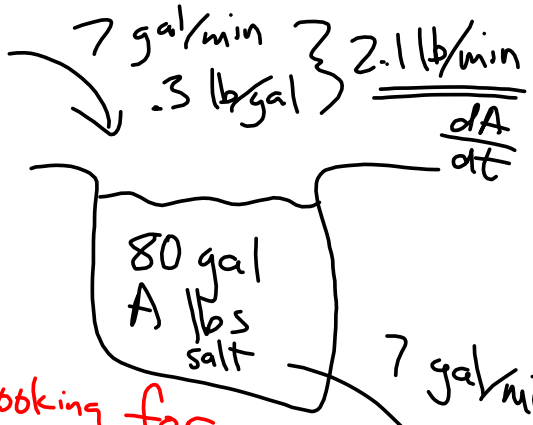
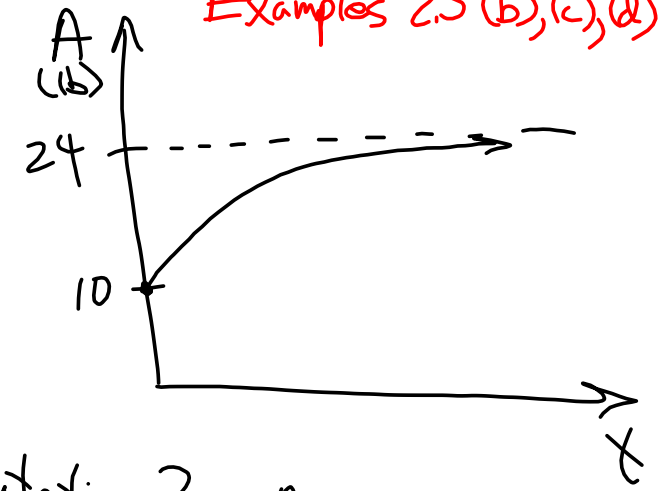


Looking for

$A = A(t)$ or $A = A(t)$

Concentration? $\frac{A}{80}$ $\frac{\text{lbs}}{\text{gal}}$



In: $7\frac{\text{gal}}{\text{min}} \cdot 0.3\frac{\text{lb}}{\text{gal}} = 2.1\frac{\text{lb}}{\text{min}}$

Out: $7\frac{\text{gal}}{\text{min}} \cdot \frac{A}{80}\frac{\text{lbs}}{\text{gal}} = \frac{7A}{80}\frac{\text{lb}}{\text{min}}$

Total $\frac{dA}{dt}$

$$\frac{dA}{dt} = \frac{dA}{dt}\Big|_{in} - \frac{dA}{dt}\Big|_{out}$$

$$\boxed{\frac{dA}{dt} = 2.1 - \frac{7A}{80}} \qquad \boxed{A(0) = 10}$$

Solve $\frac{dy}{dx} - 3y = 2$

$\frac{dy}{dx} = 3y + 2$

$dy = (3y+2)\,dx$

$\frac{dy}{3y+2} = dx$

$\int \frac{dy}{3y+2} = \int dx$

$\frac{1}{3}\ln|3y+2| = x + C_2$ $+C_1$

Solve for y

$\ln|3y+2| = 3x + C_3$

$e^{\ln|3y+2|} = e^{3x+C_3}$

$|3y+2| = e^{3x}e^{C_3}$

$3y+2 = \pm C_4 e^{3x}$ (C_4 in there!)

$3y+2 = C_5 e^{3x}$

$3y = C_6 e^{3x} - 2$

$\boxed{y = C_6 e^{3x} - \frac{2}{3}}$

$\int x^2 \frac{1}{dx}$

$|x| = 5$

$x = \pm 5$

$x^7 x^{12} =$

$x^a x^b = x^{a+b}$

$\frac{dA}{dt} = 2.1 - \frac{7}{80}A$, $A(0) = 10$

Solution

$A = 24 - 14e^{-kt}$

$dA = \left(2.1 - \frac{7}{80}A\right)dt$

$\frac{dA}{2.1 - \frac{7}{80}A} = dt$

$-\frac{7}{80}\ln\left|2.1 - \frac{7}{80}A\right| = t + C$

$\ln\left(2.1 - \frac{7}{80}A\right) = -\frac{80}{7}t + C$

$2.1 - \frac{7}{80}A = e^{-\frac{80}{7}t + C}$

$2.1 - \frac{7}{80}A = Ce^{-\frac{80}{7}t}$

$-\frac{7}{80}A = Ce^{-\frac{80}{7}t} - 2.1$

$A = Ce^{-\frac{80}{7}t} + 24$

$A(0) = 10$

$10 = C + 24$

$-14 = C$

$\boxed{A = 24 - 14e^{-\frac{80}{7}t}}$