

$$(12) \quad m(t) = \cancel{100} \cdot b^t \quad \leftarrow \text{time in days}$$

↑
mass in grams

To find b , plugin $(10, 89.2)$

$$\rightarrow \frac{89.2}{100} = \frac{\cancel{100} \cdot b^{10}}{\cancel{100}}$$

$$(0.892)^{\frac{1}{10}} = (b^{10})^{\frac{1}{10}}$$

$$0.98864 = b$$

$$m(t) = 100 (0.98864)^t$$

$$(b) \quad \frac{50}{100} = \frac{\cancel{100} (0.98864)^t}{\cancel{100}}$$

$$0.5 = 0.98864^t$$

$$\ln 0.5 = t \cdot \ln 0.98864$$

$$\frac{\ln 0.5}{\ln 0.98864} = t \approx \underline{60.7 \text{ days}} \quad \leftarrow (c)$$

$$(13) \quad m(t) = 1 \cdot b^t$$

plug in: $(10, 0.9334)$

$$(0.9334)^{\frac{t}{10}} = (b^{10})^{\frac{t}{10}}$$

$$0.99313 = b$$

$$m(t) = 0.99313^t$$

$$\begin{array}{l} 0.45 < \underline{0.5} < \underline{0.54} \\ 0.4995 < 0.500 < 0.5004 \end{array}$$

$$(b) \quad 0.500 = 0.99313^t$$

$$\ln(0.5) = t \cdot \ln 0.99313$$

$$\frac{\ln 0.5}{\ln 0.99313} = t = \overset{100.54}{100.5} \text{ minutes}$$

or 101 mins.

(c) 

$$(14) \quad m(t) = 35.6 b^t$$

plug in $(\underbrace{1.084}_{\substack{\uparrow \\ \frac{1}{2}\text{-life}}, 17.8}$ half of 35.6

$$\frac{17.8}{35.6} = \frac{\cancel{35.6} b^{1.084}}{\cancel{35.6}}$$

$$(0.5)^{\frac{1}{1.084}} = (b^{1.084})^{\frac{1}{1.084}}$$

$$0.52759 = b$$

$$(a) \quad m(t) = 35.6 (0.52759)^t$$

$$(b) \quad 25.4 = 35.6 (0.52759)^t$$

$$0.713483 = 0.52759^t$$

$$t = \frac{\ln 0.713483}{\ln 0.52759} = 0.528 \text{ yrs}$$

HW quiz 11-14-18

Sodium-22 has a half-life of 2.602 years. Start with 100g.

(a) Write an eq. in the form

$$m(t) = a \cdot b^t$$

(b) How long until only 1.00g is left?