

30. a) let W_n = the amount of water in the tub (gallons) after n minutes

$$\begin{cases} W_0 = 20 \\ W_n = 0.75W_{n-1} + 3 \end{cases}$$

b) $W_1 = 18$

The tub will contain 18 gallons of water after 1 minute.

c) $W_6 = 13.424$

The tub will contain 13.4 gallons of water after 6 minutes.

d) consider the table below

n (minutes)	0	10	20	30	40
W_n (gallons)	20	12.451	12.025	12.001	12.00008

In the long run, the amount of water in the tub approaches 12 gallons.

31. a)

n	0	1	2	3	4	5	6
V_n	1	3	7	15	31	63	127

b)
$$\begin{cases} V_0 = 1 \\ V_n = 2V_{n-1} + 3 \end{cases}$$

32. a) let C_t = the car's value (\$) t years after purchase

$$\begin{cases} C_0 = 15000 \\ C_t = 1.04C_{t-1} + 25 \end{cases}$$

b) $C_6 = 19145.61$

Six years after your purchase, the car will be worth \$19146.

c) $C_{12} = 24391.13$ and $C_{13} = 25391.77$

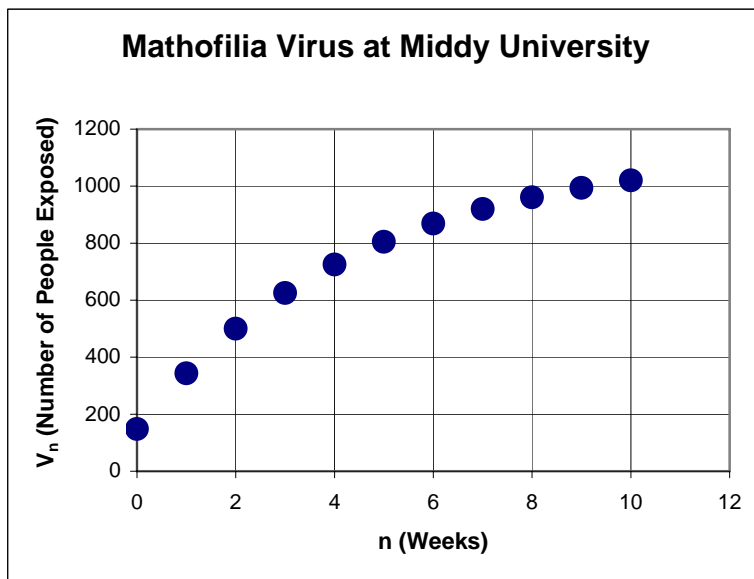
Thirteen years after your purchase, the car will be worth at least \$25,000.

33. a) $\begin{cases} V_2 = 500 \\ V_n = 0.8V_{n-1} + 225 \end{cases}$ OR $\begin{cases} V_0 = 148.4375 \\ V_n = 0.8V_{n-1} + 225 \end{cases}$

b) $V_{10} = 1020.142$

At the end of 10 weeks, 1020 people have been exposed to the mathofilia virus at Middy University.

c)



(Label 2 points!!)

d)

n	V_n
0	148.4375
10	1020.142
20	1113.741
30	1123.791
40	1124.870
50	1124.986
60	1124.999

OR

For a fixed point $V_n = V_{n-1}$

$$\text{Then } V_n = 0.8V_n + 225$$

$$\text{Let } x = V_n$$

$$x = 0.8x + 225$$

$$0.2x = 225$$

$$x = 1125$$

The fixed point of the model is 1125. That is, in the long run, 1125 people at Middy University will have been exposed to the mathofilia virus.