3. [10 points] A boat's initial value is $100,000$; it loses 15% of its value each year. The boat's maintenance cost is $500 the first year and increases by 10% annually.
In the following questions, your formulas should not be recursive.

    a. [2 points] Let B_n be the value of the boat n years after it was purchased. Find B_1 and B_2.

> *Solution:*
> $B_1 = \$100,000(0.85)$.
> $B_2 = \$100,000(0.85)^2$.

    b. [3 points] Find a formula for B_n.

> *Solution:* $B_n = 100,000(.85)^n$

    c. [2 points] Let M_n be the total amount of money spent on the maintenance of the boat during the first n years. Find M_2 and M_3.

> *Solution:*
> $M_2 = 500(1 + 1.1)$
> $M_3 = 500(1 + 1.1 + (1.1)^2)$

    d. [3 points] Find a closed form formula for M_n.

> *Solution:* $M_n = 500\dfrac{(1 - (1.1)^n)}{1 - 1.1}$