Answer on Question #56676 – Math – Calculus

1. The original value of a car is $22,000 and it depreciates (loses value) by 15% each year. What is the value of the car after three years?

A: $74.25
B: $15,895
C: $56,595
D: $13,510.75

Solution

Annual depreciation is 15%, thus the remaining price is 85% of previous value.

Value after *n* years: $P_n = P_0 \times 0.85^n$

Value after 3 years: $P_3 = \$22{,}000 \times 0.85^3 = \$13{,}510.75$

Answer: D: $13,510.75

2. A ball dropped from a height of 12 feet and returns to a height that is one-half of the height from which it fell. How far will the ball have traveled when it hits the ground for the fifth time?

A: 34.5 feet
B: 1.5 feet
C: 12 feet
D: 24 feet

Solution

The height which the ball reaches after *n* hits: $H_n = H_0 \times 0.5^n$

The height after 1st hit: $H_1 = 12 \times 0.5^1 = 6\,\text{ft}$

The height after 2nd hit: $H_2 = 12 \times 0.5^2 = 3\,\text{ft}$

The height after 3rd hit: $H_3 = 12 \times 0.5^3 = 1.5\,\text{ft}$

The height after 4th hit: $H_4 = 12 \times 0.5^4 = 0.75\,\text{ft}$

The total distance traveled by ball:

$D = H_0 + 2H_1 + 2H_2 + 2H_3 + 2H_4 = 34.5$ ft

Answer: A: 34.5 feet

3. Which of the following are geometric sequences?
Check all that apply

10, 5, 2.5, 1.25, 0.625, 0.3125 **+**

5, 10, 15, 20, 25

1, 1, 2, 3, 8, 13,

-9, -3, -1, -1/3, -1/9, -1/27 **+**

Correct options marked with "**+**". Reason: the ratio *r* is the same for each pair of terms of the sequence.