Topic: Calculating simple interest

Question: If we deposit $\$100$ into a savings account that earns $10\,\%$ simple interest per year, how much is in the account after 3 years?

Answer choices:

A $\$110$

B $\$120$

C $\$100$

D $\$130$

Solution: D

First, we need to find the interest earned in one year, by multiplying the initial amount by the annual interest rate.

$$10\,\%\ \text{of}\ \$100$$

$$0.1 \cdot \$100$$

$$\$10$$

Because the account earns simple interest, that means the interest doesn't compound, and the same interest is earned each year. Since we're looking for the account balance after three years, we add to the principal amount three times the interest earned in one year.

$$\$100 + 3(\$10)$$

$$\$100 + \$30$$

$$\$130$$

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Question: How much will we have to invest at 6% simple interest if we want to earn $\$150$ in interest in 8 years?

Answer choices:

A $\$72$

B $\$103$

C $\$312.50$

D $\$425.75$

Solution: C

Let's use the formula for finding simple interest, $I = Prt$, and rewrite it for the amount invested initially, P.

$$P = \frac{I}{rt}$$

We know the values of I, r, and t.

$$I = \$150$$

$$r = \frac{6}{100} = 0.06$$

$$t = 8 \text{ years}$$

Substitute these values to calculate principal.

$$P = \frac{\$150}{0.06(8)}$$

$$P = \$312.50$$

Topic: Calculating simple interest

Question: When Sara turned 21 years old, she invested $\$2{,}000$ at $10\,\%$ simple interest per year. How much will this investment be worth when Sara turns 65?

Answer choices:

A $\$2{,}650$

B $\$10{,}800$

C $\$12{,}000$

D $\$132{,}528.15$

Solution: B

If Sara's interest rate is $10\,\%$ and she starts with $\$2{,}000$, she'll earn

$$10\,\% \text{ of } \$2{,}000$$

$$0.1 \cdot \$2{,}000$$

$$\$200$$

per year in interest. She has 44 years ($65 - 21 = 44$) between the time that she turned 21 when she invested the money, and the time that she turns 65. So the total interest will be

$$\$200 \cdot 44$$

$$\$8{,}800$$

Therefore, when she turns 65, Sara will have a total of

$$\$2{,}000 + \$8{,}800$$

$$\$10{,}800$$