

F.IF.A.2: Evaluating Functions 1b

- The height of a golf ball hit into the air is modeled by the equation $h = -16t^2 + 48t$, where h represents the height, in feet, and t represents the number of seconds that have passed since the ball was hit. What is the height of the ball after 2 seconds?
- The equation $P = 0.0089t^2 + 1.1149t + 78.4491$ models the United States population, P , in millions since 1900. If t represents the number of years after 1900, then what is the estimated population in 2025 to the nearest tenth of a million?
- For a recently released movie, the function $y = 119.67(0.61)^x$ models the revenue earned, y , in millions of dollars each week, x , for several weeks after its release. Based on the equation, how much more money, in millions of dollars, was earned in revenue for week 3 than for week 5?
- The value, y , of a \$15,000 investment over x years is represented by the equation $y = 15000(1.2)^{\frac{x}{3}}$. What is the profit (interest) on a 6-year investment?
- Kathy deposits \$25 into an investment account with an annual rate of 5%, compounded annually. The amount in her account can be determined by the formula $A = P(1 + R)^t$, where P is the amount deposited, R is the annual interest rate, and t is the number of years the money is invested. If she makes no other deposits or withdrawals, how much money will be in her account at the end of 15 years?
- If \$5000 is invested at a rate of 3% interest compounded quarterly, what is the value of the investment in 5 years? (Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where A is the amount accrued, P is the principal, r is the interest rate, n is the number of times per year the money is compounded, and t is the length of time, in years.)
- Yusef deposits \$50 into a savings account that pays 3.25% interest compounded quarterly. The amount, A , in his account can be determined by the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where P is the initial amount invested, r is the interest rate, n is the number of times per year the money is compounded, and t is the number of years for which the money is invested. What will his investment be worth in 12 years if he makes no other deposits or withdrawals?
- The Franklins inherited \$3,500, which they want to invest for their child's future college expenses. If they invest it at 8.25% with interest compounded monthly, determine the value of the account, in dollars, after 5 years. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where A = value of the investment after t years, P = principal invested, r = annual interest rate, and n = number of times compounded per year.

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Answer Section

1 ANS:

32 ft

$$h = -16(2)^2 + 48(2) = -64 + 96 = 32$$

REF: 080508a

2 ANS:

356.9

$$P = 0.0089(125)^2 + 1.1149(125) + 78.4491 \approx 356.9$$

REF: 061422ia

3 ANS:

17.06

$$119.67(0.61)^5 - 119.67(0.61)^3 \approx 17.06$$

REF: 011603ai

4 ANS:

\$6,600

$$15000(1.2)^{\frac{6}{3}} = 21,600. \quad 21,600 - 15,000 = 6,600$$

REF: 061030ia

5 ANS:

\$51.97

$$A = P(1 + R)^t = 25(1 + .05)^{15} \approx 51.97$$

REF: 060803b

6 ANS:

\$5805.92

$$5000 \left(1 + \frac{.03}{4} \right)^{4 \cdot 5} = 5000(1.0075)^{20} \approx 5805.92$$

REF: 011410a2

7 ANS:

\$73.73

$$A = 50 \left(1 + \frac{.0325}{4} \right)^{4 \cdot 12} = 50(1.008125)^{48} \approx 73.73$$

REF: 081511a2

8 ANS:

$$\$5,279.61. \quad A = P \left(1 + \frac{r}{n} \right)^{nt} = 3500 \left(1 + \frac{.0825}{12} \right)^{12 \cdot 5} \approx 5279.61$$

REF: 080224b