

College Algebra, Section 5.4, #20
Exponential and Logarithmic Models

Inflation The average price of a house in a certain city was \$220,000 in 2008, and it increases 3% per year.¹

a. Write the equation of the exponential function that models the average price of a house t years after 2008.

Because we know the initial value of the house, a , the constant percent change r (written as a decimal), and we have equally spaced (yearly) inputs x , we can use the exponential function $y = a(1 + r)^x$ to write our model.

Using $a = 220,000$, $r = .03$ and $x = t$ years, we have:

$$y = 220,000 (1 + .03)^t$$

$$y = 220,000 (1.03)^t$$

The exponential function that models the average price of a house t years after 2008 is $y = 220,000 (1.03)^t$.

b. Use the model to predict the average price of a house in 2013.

The year 2013 is 5 years after 2008 and we substitute $t = 5$ into our model from part (a).

$$y = 220,000 (1.03)^t$$

$$y = 220,000 (1.03)^5$$

$$= 220,000 (1.158274074)$$

$$= 255,040.2963$$

The average price of a house in 2013 is predicted to be \$255,040.30.

¹Harshbarger/Yocco, *College Algebra In Context*, 5e, p. 370 #20.