# Unit 2 Lesson 26: Using the Sum

## 1 Some Interesting Sums (Warm up)

### **Student Task Statement**

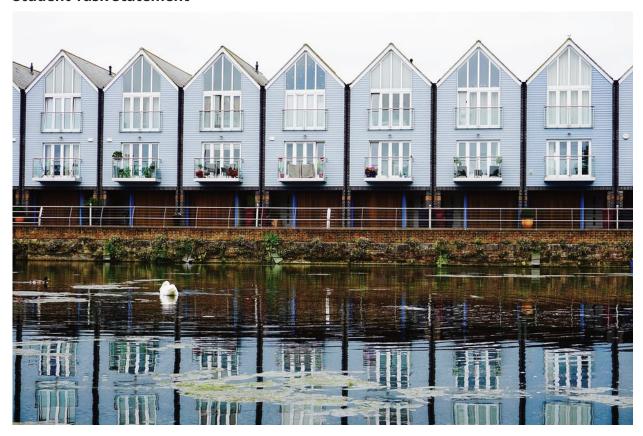
Recall that for any geometric sequence starting at a with a common ratio r, the sum s of the first n terms is given by  $s=a\frac{1-r^n}{1-r}$ . Find the approximate sum of the first 50 terms of each sequence:

1. 
$$\frac{1}{2}$$
,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{16}$ , ...

2. 1, 
$$\frac{1}{2}$$
,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ,  $\frac{1}{16}$ , ...

## 2 That's a lot of Houses

### **Student Task Statement**



In 2012, about 71 thousand homes were sold in the United Kingdom. For the next 3 years, the number of homes sold increased by about 18% annually. Assuming the sales trend continues,

- 1. How many homes were sold in 2013? In 2014?
- 2. What information does the value of the expression  $71\frac{(1-1.18^{11})}{(1-1.18)}$  tell us?
- 3. Predict the total number of house sales from 2012 to 2017. Explain your reasoning.
- 4. Do these predictions seem reasonable? Explain your reasoning.

## 3 Back to Funding the Future

#### **Student Task Statement**

Let's say you open a savings account with an interest rate of 5% per year compounded annually and that you plan on contributing the same amount to it at the start of every year.

- 1. Predict how much you need to put into the account at the start of each year to have over \$100,000 in it when you turn 70.
- 2. Calculate how much the account would have after the deposit at the start of the 50th year if the amount invested each year were:
  - a. \$100
  - b. \$500
  - c. \$1,000
  - d. \$2,000
- 3. Say you decide to invest \$1,000 into the account at the start of each year at the same interest rate. How many years until the account reaches \$100,000? How does the amount you invest into the account compare to the amount of interest earned by the account?