

### Warm Up

A family is going on a 600 mile trip and Parent 1 says they're willing to make 5 total stops, so they will break the 600 miles into 6 "legs". Parent 1's thinking is that as the trip drags on, the family will need to take breaks more and more frequently, so they decide to make the number of miles traveled in each leg a non-increasing geometric sequence.

1.) If Parent 1 decides they want to travel 80% of the previous leg on each leg, how far will they travel on each leg? Use an explicit equation to answer this question and perhaps verify with Excel or Google sheets.

$$S_6 = 600$$

$$n = 6$$

$$r = 0.8$$

$$a_1 = ??$$

$$600 = a_1 \left( \frac{1 - 0.8^6}{1 - 0.8} \right)$$

$$a_1 = 162.63 \text{ miles}$$

$$a_2 = 130.1 \text{ miles}$$

$$a_3 = 104.08 \text{ miles}$$

$$a_4 = 83.27 \text{ miles}$$

$$a_5 = 66.61 \text{ miles}$$

$$a_6 = 53.29 \text{ miles}$$

2.) If the family stops after 180 miles (the first leg is 180 miles), how far will they travel on each leg?

Hint: Use Excel/Google Sheets to solve this question by setting up a spreadsheet where  $r$  is a named cell. Vary  $r$  until the sum is 600 and find  $r$  to the nearest thousandth.

<b>n</b>	<b><math>a_n</math></b>
1	180
2	=cell above*r
3	=cell above*r
4	=cell above*r
5	=cell above*r
6	=cell above*r
<b>Total</b>	=Sum of 6 cells above. Vary r until sum is 600.