Challenge #10

Pascal and Agnesi are ready to purchase a home. They have a choice of loan options. The home they want is $150,000. Which option should they take?

- 10% down payment, 3.3% interest (compounded monthly) on a 15-year loan
- 15% down payment, 3.9% interest (compounded monthly) on a 30-year loan
Challenge #10 Solution

Pascal and Agnesi are ready to purchase a home. They have a choice of loan options. The home they want is $150,000. Which option should they take?

1. 10% down payment, 3.3% interest (compounded monthly) on a 15-year loan

   \[ \text{down} = $15,000 \]
   \[ \text{PMT} = P \left( \frac{\text{APR}}{n} \right) \frac{1}{1 - \left(1 + \frac{\text{APR}}{n}\right)^{-ny}} \]
   \[ \text{PMT} = 135000 \left( \frac{0.033}{12} \right) \frac{1}{1 - \left(1 + \frac{0.033}{12}\right)^{-12(15)}} \]
   \[ \approx $951.89 \]

   total payments: $15,000 + 951.89 \times 12 \times 15 \]
   \[ = $184,340.20 \]

2. 15% down payment, 3.9% interest (compounded monthly) on a 30-year loan

   \[ \text{down} = 0.15(150,000) = $22,500 \]
   \[ \text{finance P} = $127,500 \]
   \[ \text{PMT} = 127500 \left( \frac{0.039}{12} \right) \frac{1}{1 - \left(1 + \frac{0.039}{12}\right)^{-12(30)}} \]
   \[ \approx $601.38 \]

   total payments: $22,500 + 601.38 \times 12 \times 30 \]
   \[ = $238,996.80 \]