When submitting homework, please remember the following:
• Show all work leading to each solution.
• You must use a staple (not paper clip) if your answers are longer than a single page.
• Do not submit crossed-out or sloppy work.
• Do not submit ripped or torn pages.
• Be sure to submit your own work.

1. Suppose that in an arithmetic sequence, \( P_3 = 7 \) and \( P_{11} = 41 \).
   (a) What is \( P_{15} \)?
   (b) What is \( P_3 + \cdots + P_{11} \)?

2. Suppose that in a geometric sequence, \( P_3 = 7 \) and \( P_{11} = 41 \).
   (a) What is \( P_{12} \)?
   (b) What is \( P_3 + \cdots + P_{11} \)?

3. A quiz with 4 questions was administered to a class, and scored on a scale of 0 through 4. Here are the results:

<table>
<thead>
<tr>
<th>Grade</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>13</td>
<td>18</td>
<td>19</td>
<td>25</td>
<td>22</td>
</tr>
</tbody>
</table>

   (a) What is the mean grade?
   (b) What is the median grade?
   (c) What are the first quartile (\( Q_1 \)) and third quartile (\( Q_3 \))?
   (d) What is the 90th percentile?

4. You are purchasing a home, and need to borrow $135,000. You have two options:
   (a) Bank A offers a 30-year loan with 5.5% APR and monthly payments.
   (b) Bank B offers a 30-year loan with 5.3% APR, monthly payments, and a 4% fee that can be added to the initial loan.

Which bank offers a better deal?

5. I have a $350,000 mortgage with a 6.75% APR, compounded monthly, and a 25-year term.
   (a) What is my monthly payment?
   (b) After I have made 15 payments, what is the outstanding principal on the loan? The outstanding principal is the amount of principal still owed to the bank.

6. Suppose that a set of examination scores is normally distributed, with mean \( \mu = 81.4 \) and standard deviation \( \sigma = 2.6 \).
   (a) What are \( Q_1 \) and \( Q_3 \)?
   (b) Find scores A and B so that 95% of the examination scores are between A and B.
7. Suppose that the mean (average) of 6 numbers is 11.2, and that the smallest of the 6 numbers is 5.1. Let \( x \) be the maximum of the 6 numbers.

(a) What is the smallest possible value for \( x \)?

(b) What is the largest possible value for \( x \)?