1. Use the vertical motion formula
\[ h = -16t^2 + vt + s \]
to find the number of seconds it takes for a rocket launched with a starting velocity of 96 ft/s to reach an altitude of 45 ft. Round answers to the nearest tenth.

2. The motion of a ball scooped by a field hockey player can be modeled by
\[ h = -16t^2 + 40t, \]
where \( t \) is the time in seconds and \( h \) is the height of the ball. Will the ball ever reach 22 feet? If so, how many seconds will it take?

3. The function \( P = 0.0089t^2 + 1.1449t + 78.4491 \) models the United States population in millions since 1900. Use the function \( P \) to predict the year in which the population exceeds 1 billion.

4. Compare the quantity in Column A with the quantity in Column B.
Solve each by using the quadratic formula. Determine the greater solution of each.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 2x^2 + x - 21 = 0 )</td>
<td>( 3x^2 - 19x - 14 = 0 )</td>
</tr>
</tbody>
</table>

[A] The quantity in Column A is greater.
[B] The quantity in Column B is greater.
[C] The two quantities are equal.
[D] The relationship cannot be determined on the basis of the information supplied.
[1] after 0.5 s and after 5.5 s

[2] yes; about 0.8 seconds and about 1.7 seconds

[3] 2165

[4] B