A phone company offers two monthly plans. Plan X offers customers unlimited phone calls and text messages for $30, plus data usage for $0.01 per megabyte (MB). Plan Y offers customers unlimited phone calls, text messages, and data usage for $80.

1. Write an equation for plan X using \(c\) for the total cost of the plan and \(m\) for the number MB of data used.

\[
c = 30 + 0.01m
\]

2. Write an equation for plan Y using \(c\) for the total cost of the plan and \(m\) for the number of MB of data used.

\[
c = 80
\]

3. How many MB of data would a customer need to use in order for plan X to cost the same as plan Y?

_____ MB
The table shows the amount of data used for different tasks.

<table>
<thead>
<tr>
<th>Task</th>
<th>Data Used (MB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload 1 photo</td>
<td>0.8</td>
</tr>
<tr>
<td>Download 1 song</td>
<td>5.0</td>
</tr>
<tr>
<td>Stream 1 minute of video</td>
<td>8.0</td>
</tr>
</tbody>
</table>

4. Write an equation for the amount of data required, in MB, for uploading photos, downloading songs, and streaming video, where

\[
m = \text{total MB used,}
\]
\[
p = \text{number of photos uploaded,}
\]
\[
s = \text{number of songs downloaded, and}
\]
\[
v = \text{minutes of video streamed.}
\]

5. On average, Sam, a customer, uploads 50 photos, downloads 16 songs, and streams 6 hours of video each month. Which plan would be cheaper for Sam? How much would the plan cost?

plan _____

$_____

6. Sam wants to lower his bill by $20 by streaming less video. What percent of his current video will Sam stream to accomplish this, rounded to the nearest percent?

_____%

Center for Educational Testing and Evaluation
## Scoring Guide

<table>
<thead>
<tr>
<th>Question</th>
<th>No. of Points</th>
<th>Partial Credit?</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>No</td>
<td>Student receives 1 point for writing correct equation for Plan X: $c = 30 + 0.01m \text{ OR } c = 0.01m + 30$</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>No</td>
<td>Student receives 1 point for writing correct equation for Plan Y: $c = 80$</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>No</td>
<td>Student receives 1 point for calculating: Student’s Answer from #1 = Student’s Answer from #2 and solving for $m$. Correct answer is $m = 5,000$</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>No</td>
<td>Student receives 1 point for writing correct equation (or equivalent equation): $m = 0.8p + 5s + 8v$</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Yes</td>
<td>Student receives 2 points for choosing Plan X as the cheaper plan and calculating the correct monthly cost of $60$. Student receives 1 point for choosing correct Plan or calculating correct monthly cost but not both.</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>No</td>
<td>Student receives 1 point for calculating correct percent of current video stream of 31%. $60 - 20 = 40$ $30 + 0.01m = 40$ $m = 1000$ $0.8(50) + 5(16) + 8v = 1000$ $v = 110$ minutes $110/360 = 0.306 = 31%$</td>
</tr>
</tbody>
</table>