1. A drainage ditch is supposed to have at least 1 inch of drop for every 3 feet. If the ditch is 132 feet long, how much deeper should it be at the far end? (2 marks)

\[
\text{drop} \quad \frac{1 \text{ in}}{3 \text{ ft}} = \frac{44}{132} \quad 44 \text{ inches deeper.}
\]

2. A garage rafter is to span 28 feet. The pitch of the rafter is 10/12. What will the height be in the middle of the rafter? (3 marks)

\[
\frac{\text{rise}}{\text{run}} = \frac{10}{12} = \frac{x}{14}
\]

3. A bmx biker guy wants to build a ramp and ride up the front steps of miller. The rise of each step is 5 inches and the run of each step is 11 inches.

a) What is the pitch of the steps? (2 marks)

\[
\frac{\text{rise}}{\text{run}} = \frac{5}{11} = \frac{x}{12}
\]

b) What is the grade of the steps? (2 marks)

\[
\frac{5}{11} \times 100 = 45.45\%\]
4. Doug, a dog groomer, earns $120 for a grooming job that took 2.5 hours:
   a) What is Doug’s hourly charge? (1 mark)
      \[
      \frac{120}{2.5} = \$24 \text{ per hour.}
      \]
   b) Write a formula for Doug that he can use for any grooming job. Use \( C \) for cost and \( h \) for hours. (1 mark)
      \[
      C = \frac{24}{5} \cdot h.
      \]
   c) Find the cost of hiring Doug to groom a dog for a 4 hour grooming job. (1 mark)
      \[
      4 \times 24.82 = \$99.28
      \]
      \[
      48 \text{ dollars}
      \]
   d) A grooming job costs $168. How long did the job last? (1 mark)
      \[
      \frac{168}{24.82} \approx \frac{31.5}{48} \text{ hours}
      \]
To rent a snowmobile at Lou's Lodge in Montana, the rental company charges $80 a weekend plus twenty-seven cents ($0.27) per mile.

a) Write a formula for Lou. Use \( C \) for cost, and \( m \) for miles. \( \text{(1 mark)} \)

\[ C = 80 + 0.27m \]

b) Sketch a graph of this equation. \text{Hint: Label the x and y axis and two points on the line. (3 marks)}

c) Calculate the cost of renting a snowmobile for a weekend and driving 400 miles. \( \text{(2 marks)} \)

\[ 80 + 400 \times 0.27 = 188 \]
6. You are in the city of Winnipeg and need to take a taxi downtown. Calculate the charge of a taxi ride that lasts 12 kilometers and includes six (6) stoplights. The ride happens at 5 pm. (4 marks)

<table>
<thead>
<tr>
<th>TAXI FARE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$3.00</td>
<td>Initial Charge</td>
</tr>
<tr>
<td>50¢</td>
<td>per 1/5 km</td>
</tr>
<tr>
<td>50¢</td>
<td>per 1 minute</td>
</tr>
<tr>
<td>$1.00</td>
<td>stopped/slow traffic</td>
</tr>
<tr>
<td>75¢</td>
<td>Weekday Surcharge</td>
</tr>
<tr>
<td></td>
<td>4 pm - 8 pm</td>
</tr>
<tr>
<td></td>
<td>Night Surcharge</td>
</tr>
<tr>
<td></td>
<td>8 pm - 6 am</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
3.00 & \quad (1) \\
+ 12 \times 5 \times 0.50 & = 30 \quad (1) \\
+ 6 \times 0.50 & = 3 \quad (1) \\
+ 1.00 & \\
\hline
\$37.00 &
\end{align*}
\]