#2. Herman weighed 215 pounds when he went on a diet. He has been losing 3 pounds a week. Fill in the table.
a. Describe in words how to find Herman’s weight at the end of any week. Subtract 3 times the number of weeks.
b. If \( w \) represents the number of weeks that Herman has been dieting, write an algebraic expression for his weight.

\[
215 - w \cdot 3 = 215 - 3w = 215 - 3 \cdot w
\]

<table>
<thead>
<tr>
<th>weeks passed</th>
<th>Calculation</th>
<th>Herman’s weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>215 - 2 \cdot 3 = 209</td>
<td>209</td>
</tr>
<tr>
<td>4</td>
<td>215 - 4 \cdot 3 = 203</td>
<td>203</td>
</tr>
<tr>
<td>6</td>
<td>215 - 6 \cdot 3 = 197</td>
<td>197</td>
</tr>
<tr>
<td>9</td>
<td>215 - 9 \cdot 3 = 188</td>
<td>188</td>
</tr>
<tr>
<td>12</td>
<td>215 - 12 \cdot 3 = 179</td>
<td>179</td>
</tr>
<tr>
<td>15</td>
<td>215 - 15 \cdot 3 = 170</td>
<td>170</td>
</tr>
<tr>
<td>18</td>
<td>215 - 18 \cdot 3 = 161</td>
<td>161</td>
</tr>
</tbody>
</table>

#4. Aunt Charlotte is leaving $1000 to her cat, and the rest of her estate will be divided equally among her three nephews. Fill in the following tablet:
a. Describe in words how to find each nephew’s share of the estate.
b. If \( e \) stands for the amount of Aunt Charlotte’s estate, write an algebraic expression for the amount each nephew will inherit.

Aunt Charlotte’s Estate Calculation Each nephew’s share

<table>
<thead>
<tr>
<th>Aunt Charlotte’s Estate</th>
<th>Calculation</th>
<th>Each nephew’s share</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>( \frac{10000 - 1000}{3} )</td>
<td>( \frac{10000 - 1000}{3} = \frac{9000}{3} = 3000 )</td>
</tr>
<tr>
<td>16000</td>
<td>( \frac{16000 - 1000}{3} )</td>
<td>( \frac{16000 - 1000}{3} = \frac{15000}{3} = 5000 )</td>
</tr>
<tr>
<td>25000</td>
<td>( \frac{25000 - 1000}{3} )</td>
<td>( \frac{25000 - 1000}{3} = \frac{24000}{3} = 8000 )</td>
</tr>
<tr>
<td>40000</td>
<td>( \frac{40000 - 1000}{3} )</td>
<td>( \frac{40000 - 1000}{3} = \frac{39000}{3} = 13000 )</td>
</tr>
<tr>
<td>100000</td>
<td>( \frac{100000 - 1000}{3} )</td>
<td>( \frac{100000 - 1000}{3} = \frac{99000}{3} = 33000 )</td>
</tr>
<tr>
<td>( e )</td>
<td>( \frac{e - 1000}{3} )</td>
<td>( \frac{e - 1000}{3} ) (expression)</td>
</tr>
</tbody>
</table>

#8, #10, #12, #14, #16, #18, #20.
#8. Arturo is 12 years older than twice the age of his nephew. If Arturo’s nephew is \( t \) years old, how old is Arturo?
Arturo is \( 12 + 2t = 2t + 12 \) year old.

#10. Every winter, the Civic Society knits mittens for the children if the country orphanage. This year there are 12 more children than last year. If there were \( t \) children
last year, how many mittens will they need this year?
The number of children this year: \( t + 12 \)
The number of mittens needed: \( 2(t + 12) = 2t + 24 \)
Note: \( 2(t + 12) = 2t + 12 \)

#12. 3 less than the quotient of \( m \) divided by 12.
\[
\frac{m}{12} - 3
\]

#14. Subtract from 3 the quotient of 12 and \( m \).
\[
3 - \frac{12}{m}
\]

#16. Moira’s income is $50 more than one third of her mother’s income. If her mother’s income is \( I \), how much is Moira’s income?
Moira’s income is \( 50 + \frac{1}{3} \cdot I \).

#18. Otis buys 200 pounds of dog food at a time and uses 15 pounds a week for his dog Ralph. How much dog food does Otis have left after \( w \) weeks.
\[
200 - t \cdot 15 = 200 - 15t = -15t + 200
\]

#20. Renee receives $600 for appearing in a corn chip commercial, plus a residual of $80 each time the commercial is aired. If the commercial plays \( t \) times, how much will Renee make?
\[
\$600 + t \cdot 80 = 600 + 80t = 80t + 600
\]

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#2.#6.#8.#10.

\[
y \\
2 \\
5 \\
7 \\
8y - 6 \\
8 \cdot 2 - 6 \\
8 \cdot 5 - 6 \\
8 \cdot 7 - 6 \\
\text{Cal} = 16 - 6 = 10 \\
\text{Cal} = 40 - 6 = 34 \\
\text{Cal} = 56 - 6 = 50
\]

#6.

\[
\begin{array}{ccc}
y & 8 & 3 \\
\frac{y+12}{10} & \frac{8+12}{10} & \frac{3+12}{10} \\
\text{Cal} = \frac{20}{10} & \frac{20}{2} & \frac{15}{2} \\
\text{Cal} = \frac{21}{10} & \frac{21}{2} & \frac{21}{10}
\end{array}
\]

#8.

\[
g \\
6 \\
4.5 \\
5.6 \\
3(g - 4) \\
3(6 - 4) \\
3(4.5 - 4) \\
3(5.6 - 4) \\
\text{Cal} = 3 \cdot 2 = 6 \\
\text{Cal} = 3 \cdot 0.5 = 1.5 \\
\text{Cal} = 3 \cdot 1.4 = 4.2
\]

#10.

\[
s \\
0 \\
2 \\
6.5 \\
8 \\
\frac{s}{8-s} \\
\frac{0}{8-0} \\
\frac{2}{8-2} \\
\frac{6.5}{8-6.5} \\
\frac{8}{8-8}
\]

\[
\text{Cal} = \frac{0}{8} = 0 \\
\text{Cal} = \frac{2}{6} = \frac{1}{3} \\
\text{Cal} = \frac{6.5}{15} = \frac{65}{15} = \frac{13}{3} = 4 \frac{1}{3} = \frac{8}{0} = \text{UNDEFINED}
\]

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#24. The glass cooktop on Joy’s modern high-tech stove has the shape of a trapezoid. It is 36 inches wide at the back and 28 inches wide in front. The distance from front to back is 20 inches. What is the area of the cooktop?

\[ A = \frac{h}{2} (b + c) = \frac{20}{2} (36 + 28) = 10(36 + 28) = 10(64) = 640 \text{ in}^2. \]

The area of the cooktop is 640 in\(^2\).

#26. \( F = 32^\circ F \)

\[ C = \frac{5F - 160}{9} = \frac{5\cdot32 - 160}{9} = \frac{160 - 160}{9} = \frac{0}{9} = 0^\circ C \]