Module 4
Percent
Simple Interest
Mixture
Other Word Problems
Finding the percentage increase or decrease

The price of a technology stock has risen to $9.83 today. Yesterday's price was $9.72. Find the percentage increase. Round your answer to the nearest tenth of a percent.

\[
\text{Percentage increase} = \frac{\text{new value} - \text{original value}}{\text{original value}}
\]

\[
= \frac{9.83 - 9.72}{9.72}
\]

\[
= \frac{0.11}{9.72}
\]

\[
= 0.011 \Rightarrow 1.1\%
\]
The circle graph shows how the annual budget for a company is divided by department. If the total annual budget is $50,000,000, what amount is budgeted for Sales and Engineering combined?

Sales = 15% of budget
Eng = 15% of budget

Sales + Eng = 30% of budget

\[ 0.30 \times (50,000,000) = 15,000,000 \]
Applying the percent equation

143 is 44% of what?

\[ \begin{align*}
143 &= 0.44 \times x \\
\frac{143}{0.44} &= \\
325 &= x
\end{align*} \]
Simple interest

Jane deposits $5000 into an account that pays simple interest at a rate of 2% per year. How much interest will she be paid in the first 3 years?

\[
I = Prt
\]

\[
= (5000)(0.02)(3)
\]

\[
= $300
\]
Solving a percent mixture problem using a linear equation

Rachel invested her savings in two investment funds. The amount she invested in Fund A was \(4\) times as much as the amount she invested in Fund B. Fund A returned a 5% profit and Fund B returned a 3% profit. How much did she invest in Fund A, if the total profit from the two funds together was $1610?

\[
\begin{array}{ccc}
\text{Amt} & \text{Yield} & \text{Profit} \\
A & 4x & .05 \times 4x \\
B & x & .03x \\
\end{array}
\]

\[
.05(4x) + .03x = 1610 \\
.2x + .03x = 1610 \\
.23x = 1610 \\
x = 7000
\]

\[
A = 4(7000) = 28000
\]
Two factory plants are making TV panels. Yesterday, Plant A produced 10,000 panels. Ten percent of the panels from Plant A and 3% of the panels from Plant B were defective. How many panels did Plant B produce, if the overall percentage of defective panels from the two plants was 8%?

<table>
<thead>
<tr>
<th></th>
<th># prod.</th>
<th>% def.</th>
<th>Total def.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10,000</td>
<td>0.10</td>
<td>1,000</td>
</tr>
<tr>
<td>B</td>
<td>x</td>
<td>0.03</td>
<td>0.03x</td>
</tr>
<tr>
<td>Total</td>
<td>10,000+x</td>
<td>0.08</td>
<td>0.08(10,000+x)</td>
</tr>
</tbody>
</table>

\[
x = \text{# panels prod. by plant B}
\]
\[
1000 + 0.03x = 0.08(10000 + x)
\]
\[
1000 + 0.03x = 800 + 0.08x - 0.03x
\]
\[
1000 = 800 + 0.05x
\]
\[
200 = 0.05x
\]
\[
x = \frac{200}{0.05} = 4000
\]

4,000 panels
A small publishing company is planning to publish a new book. The production costs will include one-time fixed costs (such as editing) and variable costs (such as printing). There are two production methods it could use. With one method, the one-time fixed costs will total $22,121, and the variable costs will be $25.50 per book. With the other method, the one-time fixed costs will total $57,065, and the variable costs will be $12.50 per book. For how many books produced will the costs from the two methods be the same?
With one method, the one-time fixed costs will total $22,121, and the variable costs will be $25.50 per book. With the other method, the one-time fixed costs will total $57,065, and the variable costs will be $12.50 per book.

\[ x = \# \text{ of books produced} \]

\[
\begin{align*}
\text{Cost Method 1} &= \text{Cost Method 2} \\
22,121 + 25.50x &= 57,065 + 12.50x \\
-12.50x &= -12.50x \\
22,121 + 13x &= 57,065 \\
-22,121 &= -22,121 \\
13x &= 34,944 \\
x &= 2,688 \text{ books}
\end{align*}
\]
Finding the value for a new score that will yield a given mean average.

- Rueben has scored 33, 21, 18, 22, and 18 points in his five basketball games so far. How many points does he need to score in his next game so that his average (mean) is 23 points per game?

\[
\chi = \text{points scored in 6th game} \\
\text{average of 6 scores} = 23 \\
\frac{33+21+18+22+18 + \chi}{6} = 23 \\
16 + \chi = 138 \\
\chi = 26
\]