Chapter 2 Chapter Test - Selected Problems

#2 / page 107  Solve \( b + \frac{3}{4} = \frac{5}{8} \)

\[ \text{LCD = 8, multiply through by 8!} \]
\[ \frac{8}{1} \cdot b + \frac{8}{1} \cdot \frac{3}{4} = \frac{8}{1} \cdot \frac{5}{8} \]
\[ 8b + 6 = 5 \]
\[ -6 \]
\[ \frac{8b}{8} = -1 \]
\[ \frac{b}{8} = -\frac{1}{8} \]

\( b = -\frac{1}{8} \)

#8 / page 107  Solve for \( R \): \( E = IR + IR \)

\( R \) is the \textit{variable}, others are just \textit{stuff}.

Get all \textit{variable} terms isolated on one side!

\[ \frac{E - IR}{I} = \frac{IR}{I} \]

\[ \frac{E - IR}{I} = R \quad \text{divide by} \ I \]
Solve $3x - 2 \geq 6x + 7$

\[ \begin{align*}
+2 & \quad +2 \\
3x & \geq 6x + 9 \\
-6x & -6x \\
-3x & \geq 9 \\
\end{align*} \]

divide by $-3$, switch direction (dividing by a negative number!)

$x \leq -3$

Another way:

\[ \begin{align*}
3x - 2 & \geq 6x + 7 \\
-3x & -7 & -3x & -x \\
-9 & \geq 3x \\
\text{divide by 3, don't switch direction} .
\end{align*} \]

$-3 \geq x$

Same as $x \leq -3$
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\[ 4x - 1 > 5 \quad \text{or} \quad 2 - 3x < 8 \]

\[
\begin{align*}
4x & > 6 \quad & -3x & < 6 \\
\frac{x}{4} & > 1 & \frac{x}{-2} & > -2
\end{align*}
\]

\[ x > 1.5 \quad \text{or} \quad x > -2 \]

\[ x > 1.5 \quad \text{or} \quad x > -2 \]

Since this is or, take any element that appears in either graph.

Answer

\[ x > -2. \]

\#15/page 108

The sum of two integers is 15...

First integer = \( x \), Second integer = 15 - \( x \)

(smaller) \quad \text{(larger)}

... eight times the smaller is one less than 3 times the larger

\[ 8x = 3(15 - x) - 1 \]

\[ 8x = 45 - 3x - 1 \]

\[ -3x \]

\[ 11x = 44 \]

\[ x = 4 \]
Butcher combines 100 lb. hamburger at $1.60/lb. with 60 lb. hamburger at $3.20/lb.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1.60</td>
<td>$160</td>
</tr>
<tr>
<td>+ 60</td>
<td>3.20</td>
<td>$192</td>
</tr>
<tr>
<td>= 160 lb</td>
<td>x</td>
<td>= $352</td>
</tr>
</tbody>
</table>

So \( 160 \cdot x = 352 \).

\( \frac{352}{160} \) \( x = 2.2 \) \( \Rightarrow \) $2.20 per pound.
#23/page 108  A jogger runs a distance at 8 mph and back at 6 mph. Total running time was 1:40.
Find the total distance.

\[ D = RT \]

\[ R_1 \cdot T_1 = D \]

\[ R_2 \cdot T_2 = D \]

\[ T_1 = \frac{D}{R_1} = \frac{D}{8} \]

\[ T_2 = \frac{D}{R_2} = \frac{D}{6} \]

and \[ T_1 + T_2 = 1:40 = 1\frac{2}{3} \text{ hr.} = \frac{5}{3} \]

So \[ \frac{D}{8} + \frac{D}{6} = \frac{5}{3} \]

Solve for \( D \).

\[ \text{LCD} = 24 \]

\[ \frac{3}{24} \cdot D + \frac{4}{1} \cdot \frac{D}{6} = \frac{8}{24} \cdot \frac{5}{3} \]

\[ 3D + 4D = 40 \]

\[ 7D = 40 \]

\[ D = \frac{40}{7} = 5.7 \text{ miles} \]

Total distance = \( 11.4 \text{ miles} \)