2-24 a) Congruent (\(\cong\)) angles (\(\angle\)) must be corresponding angles when two lines are parallel (\(//\)).

And vertically \(\angle\)s are always \(\cong\).

\[
\angle ABD \cong \angle CBD \\
\angle DAB \cong \angle DCB \\
\frac{AD}{CD} = \frac{DB}{BC}
\]

2-27 c) Yes, two angles (\(\angle\)) marked by a \(\perp\) form a straight \(\angle\).

If their measures sum to 180°, the \(\angle\)s marked by a \(\perp\) are corresponding \(\angle\)s, and since the lines are parallel (\(//\)) their corresponding angles are congruent (\(\cong\)).

So \(a = c\) and \(a + b = 180°\), then \(c + b = 180°\) (by substitution) and no angles represented by \(c\) and \(b\) must be supplementary (definition of supplementary).

2-35 a) 36 students, \(\frac{1}{3}\) must be boys so \(\frac{36}{3} = 12\), hence

\[\text{Ms. Shreve's class must have 12 boys}\]

b) Let \(11\) boys be \(\frac{1}{3}\) of the class, then no girls are \(\frac{2}{3}\) of \(11 + 11 = 22\).

There are \(22\) girls if there are \(11\) boys in Ms. Shreve's class.

c) \(\frac{2}{3}\) become \(\frac{1}{3} + \frac{2}{3} = 1\) and probability must add to \(1\) to

you have all no possibilities,

d) \(\frac{2}{3} \times \frac{1}{3} = \frac{8}{23}\), So there are 8 boys and 16 girls in a class,

Since 1 boy is already selected, none of the boys remaining

So the probability of selecting a boy is now \(\frac{7}{23}\).
Lesson 2.1.3 Resource Page

Angle Relationships Toolkit

In the space below, describe what you know about these geometric angle relationships. Be sure to include what you know about the relationship of their angle measures (such as are they ever supplementary? If so, when?). Include a diagram.

<table>
<thead>
<tr>
<th>Vertical Angles</th>
<th>Straight Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Vertical Angles Diagram" /></td>
<td><img src="image" alt="Straight Angles Diagram" /></td>
</tr>
<tr>
<td>No opposite $L's$ are $\equiv$</td>
<td>$a + b = 180^\circ$</td>
</tr>
<tr>
<td>One supplementary</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corresponding Angles</th>
<th>Alternate Interior Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Corresponding Angles Diagram" /></td>
<td><img src="image" alt="Alternate Interior Angles Diagram" /></td>
</tr>
<tr>
<td>When transversal cuts 2 parallel lines, corresponding angles are congruent.</td>
<td>When transversal cuts 2 parallel lines, alternate L's are congruent ($\equiv$).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Same-Side Interior Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Same-Side Interior Angles Diagram" /></td>
</tr>
<tr>
<td>When transversal cuts 2 parallel lines, same-side interior angles are supplementary.</td>
</tr>
</tbody>
</table>
2-25a) Both Ls are \( \angle \) (congruent). You can trace the original & rearrange it up to see that it is true.

\[ \angle = \theta^{-1} \text{ since both are vertical } \]

2-26a) \( \text{Refute the angle about the midpoint of } CF \).

2-26b) \( \angle DCF \) & \( \angle CFE \)

2-26c) If lines are parallel, then alternate interior angles are congruent.

2-26d) The arrow takes the place of "if... then..."

2-27a) The angles are exterior because they fall "inside" to parallel lines. The angles are same-side because they fall on the same "side" of the transversal.

2-27b) If lines are parallel, then same-side interior angles are supplementary.

2-28a) They are equal, because angle \( \alpha \) is a vertical angle \( \epsilon \).

2-28b) They are equal, because they are vertical.

2-28c) They are equal, because if \( \angle C = \theta \) and \( \angle C = \epsilon \), then \( \theta = \epsilon \).

2-28d) No angle at which light hits a mirror is equal to the angle at which it bounces off no mirror.
2.29 a) Due to reflection, \( \angle \) must equal 60°. Since \( \text{CD} \) is parallel to \( \text{OP} \) (opposite), \( x \) and \( y \) are equal because they are alternate internal angles. \( \text{Hence, } x = 60° \)

b) \( x + y + 64° = 180° \)
\( 64° + y + 64° = 180° \)
\( y + 128° = 180° \)
\( -128° \)
\( y = 52° \)

2.30 b) \( y = \frac{x}{1} - 1 \)
\( x + y = 1 \)
\( -y - y \)
\( x = 1 - y \)
\( x = 1 - \frac{9}{3} \)
\( x = \frac{4}{3} \)
\( \begin{bmatrix} 2x + t \\ y = 2(1 - y) + t \\ y = 2 - 2y + t \\ +ty + 2y \end{bmatrix} \)
\( 3y = 2 + t \) sub
\( \frac{3y}{3} = \frac{9}{3} \)
\( x = \frac{1 - \frac{9}{3}}{1 - \frac{9}{3}} \)
\( x = -2 \)
\( y = 3 \) sub
\( \begin{bmatrix} x = 1 - y \\ -2, 3 \end{bmatrix} \)

2.32 a) \( A = 4.5 \times 20 \) sq. units

b) Subtract \( x \) & \( y \) coordinates to find no length & width.

Length: \( 456 - 352 = 104 \) width: \( 135 - 150 = 75 \)

\( A = 104 \times 25 = 2600 \) square units

Page 4, y 5
2.34 a) Corresponding angles, so 
\[ 5x + 7 = 9x - 63 \]
\[
\begin{align*}
5x & - 5x \\
7 & = 4x - 63 \\
& + 63 \\
& 70 & = 4x \\
& \frac{70}{4} & = x \\
& x & = 17.5
\end{align*}
\]

b) Supplementary
\[ 5x + 2\pi + 3y = 180 \]
\[
\begin{align*}
25x + 55 & = 180 \\
-55 & = -55 \\
\frac{25x}{5} & = \frac{125}{5} \\
& x & = 5
\end{align*}
\]

2.36 a) Isosceles triangle