8-78 a) She should pick the \(8^\text{th} \times 10^\text{th}\) size. It will be similar to the \(4^\text{th} \times 5^\text{th}\) photo, so enlarging will fit perfectly.

b) \(4 \times 5 \rightarrow r=2 \rightarrow 8 \times 10\)

So area ratio is \(2^2 = 4\), so the enlarged one is \(4\) times the area.

Therefore, the cost of the paper will be \(0.45 \times 4 = \$1.8\).

c) \(8 \div 0.45 = 16\) since the cost is 16 times more, the region factor is \(178 = 4\)

Thus the photo is \(16^\text{th} \times 20^\text{th}\)

<table>
<thead>
<tr>
<th>8-79</th>
<th>Ratio Side</th>
<th>Percentage</th>
<th>Ratio Remaining</th>
<th>Area</th>
<th>Ratio Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Small</td>
<td>3/5</td>
<td>42</td>
<td>42/100 = 3/5</td>
<td>90</td>
</tr>
<tr>
<td>b)</td>
<td>1/3</td>
<td>4.5</td>
<td>9.5</td>
<td>9.5/28.4 = 11/3</td>
<td>2/3</td>
</tr>
<tr>
<td>c)</td>
<td>5/40</td>
<td>0.125</td>
<td>28</td>
<td>28/224 = 1/8</td>
<td>27</td>
</tr>
</tbody>
</table>

8-80) There is not enough information, while the area appears to grow proportionally, that does not guarantee that the sides do.

8-81) The ratio of the Areas is \(900/100 = 9\), therefore \(r = \sqrt{9} = 3\).

Since the perimeter of the figure is \(44\) cm, then the perimeter of the enlarged figure is \(3 \times 4.4 \text{ cm} = 13.2 \text{ cm}\)

\[8-82) \frac{\text{Perimeter of Similar Figure}}{\text{Perimeter of Original Figure}} = r\]

\[\frac{\text{Area of Similar Figure}}{\text{Area of Original Figure}} = r^2\]

Since the figure is a square, the area is also square units.

8-83) a) \(3^\text{rd}\) b) \(5, 8, 10\) c) \(a^2\)

8-84) a) 12-gm area \(= 12 \left(\frac{1}{2} \times 6 \times 11.2\right) \approx 403.2 \text{ cm}^2\)

\[\tan 150^\circ = \frac{3}{m}\]

\[m = \frac{3}{\tan 150^\circ}\]

\[m \approx 11.2\]

5-65 a) \(5+1=6\), so no two sides will collapse on the third side.

b) Answers will vary. One solution is \(2, 5, \) and \(6\).

Reminder, any 2 sides must add up to bigger than the third.
8-86 The equation for a geometric sequence is $a_n = a_1 r^{n-1}$.

The equation for an arithmetic sequence is $a_n = a_1 + (n-1)d$.

This sequence $17, 16\frac{1}{2}, 16, 15\frac{3}{4}, ...$ is arithmetic since the same amount subtracted from each term.

Thus, $a_n = 17 - \frac{1}{2}(n-1)$

$a_{150} = -\frac{1}{2} (150-1) + 17$

$= -\frac{1}{2} (149) + 17 = -74.5 + 17 = -57.5$

8-88 a) AAS $\cong$, $\triangle ABC \cong \triangle DCB$

b) ASA $\cong$, $\triangle ABC \cong \triangle EDC$

8-89)

$y = \frac{1}{2}x - 4$

$x - 4y = 12$

Substitute for $y = \frac{1}{2}x - 4$

$x - 4 \left( \frac{1}{2}x - 4 \right) = 12$

$x - 2x + 16 = 12$

$-x + 16 = 12$

$x = 4$

Substitute for $x = 4$

$y = \frac{1}{2} \cdot 4 - 4$

$y = 2 - 4 = -2$

Since $x = 4$ and $y = -2$

The solution is $13 \left(4, -2\right)$.