8.2 a) Yes, one angle must be 120°. The three 6's complete a circle, so they must add up to 360°. 
360° / 3 = 120°

b) Six-sided polygon

c) Any 7-sided figure with straight sides that is closed.

6.2 You can build two more pinwheels; one using 9 6's and another using 18 6's.

6.3 a) 

| Angle   | Answer to the
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 answers</td>
</tr>
<tr>
<td>A</td>
<td>8 6's, 45° central (360° / 8 = 45°)</td>
</tr>
<tr>
<td>B</td>
<td>Not possible</td>
</tr>
<tr>
<td>C</td>
<td>5 6's, 72° central (360° / 5 = 72°)</td>
</tr>
<tr>
<td>D</td>
<td>Not possible</td>
</tr>
<tr>
<td>E</td>
<td>12 6's, 30° central (360° / 12 = 30°), Regular Dodecagon</td>
</tr>
<tr>
<td>F</td>
<td>Not possible</td>
</tr>
</tbody>
</table>

b) You must be able to divide no 6's by into 360° evenly.

   i.e. 360 / 12 = 30° while 360 / 11 = 32.72... not possible!

c) Yes; the 90° divides evenly into 360°. (360 / 40 = 9) possible
   (360 / 32 = 11.25) NOT possible
   (360 / 108 = 3.3) NOT possible

8.4 a) Each angle of an equilateral D is 60°.

   360° / 6 = 60°
   So, he will need 6 triangles

b) Regular Hexagon

c) The vertices of convex polygons point outward, while some of the
   vertices of non-convex polygons point inward, i.e, convex
   shapes can blow but not like a balloon.

   See the math notes often 8-5 for a Formal Definition.
8–5 a) Triangle (1), (3), and (4) will create convex polygons. This is because the \(180^\circ\)'s are isosceles (or equilateral) and the non-base angles divide evenly into \(360^\circ\).

b) \(\Delta (1): 5 \text{ \textdegree}'s, \) regular pentagon \((360^\circ ÷ 72^\circ = 5)\)

c) \(\Delta (3): 18 \text{ \textdegree}'s, \) regular 18-gon \((360^\circ ÷ 20^\circ = 18)\)

d) \(\Delta (4): 9 \text{ \textdegree}'s, \) regular nonagon \((360^\circ ÷ 40^\circ = 9)\)

8–6 a) \(x = 75^\circ + 35^\circ = 110^\circ\)

b) \(2x = 140^\circ, \) \(x = 70^\circ\)

c) \(y = 144^\circ, \) \(x + 100^\circ = 148^\circ\)

8–8 d) The measure of an exterior angle of a triangle equals the sum of the measures of its remote interior angles.

\[
\text{Statement} \quad \text{Reason}
\]

1) \(a + b + c = 180^\circ\) \(\) The sum of the interior \(\text{\textdegree}'s\) of a \(\Delta\) is \(180^\circ\)

2) \(x + c = 180^\circ\) \(\) Straight \(\angle\)

3) \(a + b + c = x + c\) \(\) Substitution \(\) (b\text{omt} \(\text{\textdegree}, \) \(z = 180^\circ\))

4) \(a + b = x\) \(\) Subtracting \(c\) from both \(\text{\textdegree}'s\)

5) \(a + b = x\) \(\) is proven for all \(\text{\textdegree}'s\)

8–9 \(5x = 360^\circ\)

\[
\begin{align*}
x & = \frac{360^\circ}{5} = 72^\circ \\
2y + x & = 180^\circ \\
2y + 72^\circ & = 180^\circ \\
y & = 108^\circ \\
y & = 54^\circ
\end{align*}
\]

8–10 \(360^\circ ÷ 15 = 24\) \(\) So, you would need 24 \(\text{\textdegree}'s\)

8–7 a) no, has a curve \(\) b) yes \(\) c) no, \(\text{\textdegree}'s\) cross \(\) d) yes \(\) e) no, not closed \(\) f) yes \(\) g) yes \(\) h) no, not closed.
8-11 a) \[ \triangle \text{by ASA} \quad x + 73^\circ + 28^\circ = 180^\circ \quad x = 79^\circ \]

b) \[ \text{by AA, ambiguous} \]

c) \[ \triangle \text{by AAS} \]

\[ \text{Sin} 30^\circ = \frac{1}{2} \quad \text{Short leg} = 3 \quad \text{Long leg} = 8 \quad \text{So} \quad x = 8 \sqrt{3} - 8 \]

\[ x \approx 5.9 \text{ units} \]

d) \[ \triangle \text{by SAS} \]

\[ \tan x^\circ = \frac{9}{5} \quad \tan^{-1} \left( \frac{9}{5} \right) = x^\circ = 60.9^\circ \]

8-12 a) True
b) False

c) True
d) True