7-40. Regular Hexagon: Core region is an equilateral Δ. →

- Core region is a RT, Δ.
- Any one of
- And face 6 planes

Rhombus must not assume; mirror must be an RT L & no core region Δ.
Circle: Impossible

7-41a) The Δ's are equilateral and 45°. A regular hexagon could also be created with 12 30°-60°-90° triangles since each is half of an equilateral 30°-60°-90°.

b) The core region is a 30°-60°-90° Δ. Yes, all regular polygons can be created with a RT, Δ.

(See this one 6, 30°-60°-90° Δ's)

See diagram above

Since all reflected Δ's are ∼ RT, Δ's, the diagonals must be bisectors of each other.

7-42a) \( \theta = 45° \) because the central Δ's 360° and 360° / 8 = 45°

\[ s + q = C \]

\[ C^2 = 25 + 81 = 106 \]

\[ C = \sqrt{106} \approx 10.295 \]

Perimeter = 4 \( \sqrt{106} \) ≈ 41.18 units

7-43a) 360 / 36 = 10, so this polygon had 10 sides.

b) Regular decagon or regular 10-gon 10-gon
7-45) \((-3,5)\) and \((7,3)\)’s midpoint is \(\left(\frac{-3+7}{2}, \frac{5+3}{2}\right) = (2, 4)\).

So, she is correct!

7-46) \(AB = 18\) mm

7-47) Since \(\triangle ABC \cong \triangle DEC\), all corresponding parts are \(\cong\).

- Since \(\triangle AEB \cong \triangle DEC\), \(\angle E = \angle AEB = \angle DEC\), and \(\overline{AE} \parallel \overline{DE}\).

So statement A is true. \((\overline{AC} \parallel \overline{DE})\) and \((\overline{AB} \parallel \overline{ED})\).

7-48) \((C_1)^2 = 6^2 + 2^2\)
\[C_1 = \sqrt{36 + 4} \approx 6.32\]

\((C_2)^2 = 3^2 + 5^2\)
\[C_2 = \sqrt{9 + 25} \approx 5.83\]

Therefore, \(C\) is closer to \(B\).
For each pair of triangles below, determine whether or not the triangles are similar. If they are similar, show your reasoning in a flowchart. If they are not similar, explain how you know. [See answers below.]

a. 
\[
\begin{align*}
A & \quad Y \\
X & \quad Z \\
B & \quad C
\end{align*}
\]

\[\angle BAC = \angle XZY\]
\[\angle ACB = \angle ZYX\]
\[\triangle ABC \sim \triangle XZY\]
AA ~

b. 
\[
\begin{align*}
6 & \quad 6 \\
10 & \quad 7 \\
3 & \quad 4
\end{align*}
\]

\[GU = \sqrt{10^2 - 6^2} = 8\]
\[FD = \sqrt{3^2 + 4^2} = 5\]

\[
\frac{FE}{BU} = \frac{3}{6} = \frac{1}{2}\]
\[
\frac{DE}{GU} = \frac{4}{8} = \frac{1}{2}\]
\[
\frac{FD}{BG} = \frac{5}{10} = \frac{1}{2}\]

\[\triangle FED \sim \triangle BUG\]
SSS ~

[Not similar because corresponding sides do not have the same ratio.]