1. Construct a Venn diagram to determine the validity of the given argument:

1. All squares are rectangles
2. Some quadrilaterals are rectangles

Therefore, some quadrilaterals are squares

2. Fill in the blanks with what are most likely to be next letters. Explain the pattern generated by your answer.

O, T, T, F, ------, ------, ------
F, S, S, M, ------, ------, ------
T, F, S, E, ------, ------, ------

3. Explain the general rule or pattern used to assign the given letter to given word. Fill in the blank with the letter that fits the pattern.

<table>
<thead>
<tr>
<th>circle</th>
<th>square</th>
<th>trapezoid</th>
<th>octagon</th>
<th>hexagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>k</td>
<td>w</td>
<td>c</td>
<td>-------</td>
<td>-------</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>circle</th>
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<th>Pentagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>r</td>
<td>z</td>
<td>g</td>
<td>-------</td>
<td>-------</td>
</tr>
</tbody>
</table>

5. Find the negation of each statement:

a) David is a professor
b) Samantha is a college graduate
c) All college graduates have taken English 101
d) Some of the college graduates have not taken Mat 142
e) No animals are warm blooded
f) None of the fruits is red
6. Using the symbolic representations
   \( p \): A person plays the guitar
   \( q \): A person rides a motorcycle
   \( r \): A person wears a leather jacket

   express the following compound statements in symbolic form.
   a. A person plays a guitar and rides a motorcycle or wears a leather jacket
   b. A person rides a motorcycle and wears a leather jacket
   c. A person wears a leather jacket or plays a guitar
   d. If a person rides a motorcycle then the person wears a leather jacket
   e. If a person plays a guitar then the person does not wear a leather jacket

7. Using the symbolic representations

   \( p \): I am innocent
   \( q \): I have an alibi
   \( r \): I go to jail

   express the following in words:
   a. \((p \lor q) \rightarrow \neg r\)
   b. \((\neg p \lor q) \rightarrow r\)
   c. \((p \land q) \rightarrow \neg r\)
   d. \((p \lor r) \rightarrow \neg q\)

8. Make truth table for the compound statement \((p \lor q) \rightarrow \neg r\)

9. Using truth table prove the De Morgan’s laws:
   a. \(\neg (p \lor q) \equiv p \land \neg q\)
   b. \(\neg (p \land q) \equiv p \lor \neg q\)

10. Determine whether the following argument is valid “No snake is warm blooded. All mammals are warm blooded. Therefore, snakes are not mammals,” USE THRUTH TABLE.

   Use the following symbols.

   \( p \): it is warm blooded  \( q \): It is a mammal  \( r \): It is a snake