1.  Determine the truth value of the following statement:
The Leaning Tower of Pisa is located in England and all prime numbers divisible by 1.

True or False

2. Construct a truth table for (p V q)$\rightarrow \~p$

**3.** Fill in the heading of the following truth table using any of *p, q*, ,$\rightarrow \leftrightarrow V$, and Λ.

|  |  |  |
| --- | --- | --- |
| *p* | *q* | \_\_\_\_\_\_\_\_\_ |
| **T** | **T** | **F** |
| **T** | **F** | **T** |
| **F** | **T** | **F** |
| **F** | **F** | **F** |
|  |  |  |

4. Construct a truth table for $\rightarrow \~p$ (~p Vq)

5. Given p is true, q is true, and r is false, find the truth value of the statement ~q $\rightarrow $ (~p Λ r). Show step by step work.

6. Determine which, if any, of the three statements are equivalent.
I) If the pipe is leaking, then I will not call the roofer.
II) Either the pipe is leaking or I will call the roofer.
III) If the pipe is not leaking, then I will call the roofer.

I and II are equivalent

II and III are equivalent

I and III are equivalent

I, II, and III are equivalent

None are equivalent

7. Write the argument below in symbols to determine whether it is valid or invalid. State a reason for your conclusion. Specify the p and q you used.

Either the gazebo is made of wood or the vine is growing on the gazebo.
The gazebo is not made of wood.
$∴ $The vine is growing on the gazebo.