

Write each sentence in symbolic form using the given symbols:

Let p represent “it is cold”

Let q represent “it is snowing”

Let r represent “the sun is shining”

- | | |
|---|----|
| 1. It is cold and it is snowing | 1. |
| 2. It is not cold | 2. |
| 3. It is snowing and the sun is not shining | 3. |
| 4. It is not cold and it is not snowing | 4. |
| 5. The sun is not shining and it is not cold | 5. |
| 6. It is not the case that it is snowing and it is not cold | 6. |
-

“Or” & “And” Truth Tables

P	Q	$P \vee Q$	P	Q	$P \wedge Q$
T	T		T	T	
T	F		T	F	
F	T		F	T	
F	F		F	F	

Three sentences are written. The truth values are given for the first two. Determine if the third sentence is true, false, or uncertain.

- | | |
|---|--|
| 1. She will sink [false]
She will swim [true]
She will sink or swim [_____] | 4. I have a headache and I take a nap [false]
I have a headache [true]
I take a nap [_____] |
| 2. It is raining and I get wet [true]
It is raining [true]
I get wet [_____] | 5. I will work after school or I will study more [true]
I will work after school [false]
I will study more [_____] |
| 3. Both a potato and a hurricane have many eyes [false]
A potato has many eyes [true]
A hurricane has many eyes [_____] | 6. Michael cannot swim or Michael cannot skate [false]
Michael cannot swim [false]
Michael cannot skate [_____] |

Identify the hypothesis and the conclusion:

1. If it rains, then the game is cancelled
2. When it rains, then I do not have to water the lawn
3. You can get to the stadium if you take the Third Avenue bus.
4. If a polygon has exactly three sides, it is a triangle.

Write each sentence in symbolic form using the given symbols:

Let p represent "the test is easy"

Let q represent "Sam studies"

Let r represent "Sam passes the test"

- | | |
|--|----|
| 1. If the test is easy, then Sam will pass the test. | 1. |
| 2. If the test is not easy, then Sam will not pass the test. | 2. |
| 3. The test is easy, if Sam studies | 3. |
| 4. Sam will not pass the test if Sam doesn't study | 4. |

P	Q	$P \rightarrow Q$
T	T	
T	F	
F	T	
F	F	

For each given statement, write the statement in symbolic form using the symbols given and tell whether the conditional statement is true or false based on the truth values given.

Let r represent "the race is difficult" [true]

Let p represent "Karen practices" [false]

Let w represent "Karen wins the race" [true]

1. If Karen practices, then Karen will win the race
2. If Karen wins the race, the race is difficult
3. Karen will not win the race if Karen does not practice
4. Karen practice if the race is difficult
5. If the race is difficult and Karen does not practice, then Karen will not win the race

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Original Statement: $p \rightarrow q$

Converse:

Inverse:

Contrapositive:

Original statement: If it is sunny outside,
then it is not raining.

Symbolic Logic:

Truth Value:

7. Converse:

1.

1.

8. Inverse:

2.

2.

9. Contrapositive:

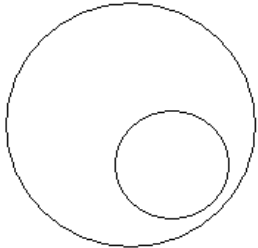
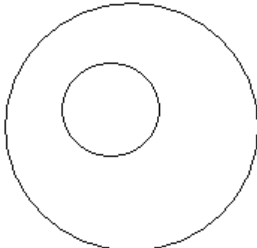
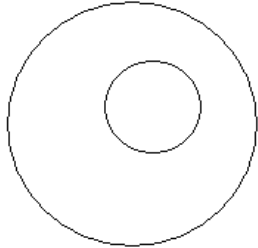
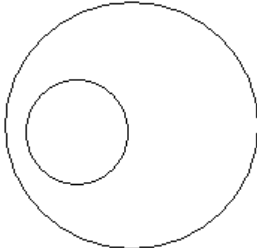
3.

3.

Draw a Venn diagram to illustrate the following conditionals:

<p>If you live in Chicago, then you live in Illinois.</p>	<p>If something is a golden retriever, then it is a dog.</p>
<p>If you live in New England, then you live in the United States.</p>	<p>If you play the flute, then you are a musician.</p>

Write a conditional statement that each Venn diagram illustrates

Write a statement beginning with *All*, *Some*, or *No* to match each Venn diagram.

