3. Write the component statements of the following compound statements and check whether the compound statement is true or false.

(i) 57 is divisible by 2 or 3.

Solution:

A compound statement is a combination of two statements (Components).

So, the components of the given statement “57 is divisible by 2 or 3” are

p: 57 is divisible by 2.

q: 57 is divisible by 3.

Now, the given compound statement is in the form of P V Q, that has truth value T whenever either P or Q or both will true.

Hence, the given statement is true.

(ii) 24 is a multiple of 4 and 6.

Solution:

A compound statement is a combination of two statements (Components).

So, the components of the given statement “24 is a multiple of 4 and 6” are

p: 24 is a multiple of 4.

q: 24 is a multiple of 6.

Now, both the component p and q are true. As 24 is a multiple of both 4 and 6

Hence, the given statement is true.

(iii) All living things have two eyes and two legs.

Solution:

A compound statement is a combination of two statements (Components).

So, the components of the given statement “All living things have two eyes and two legs” are

p: All living things have two eyes.

q: All living things have two legs

Now, the given compound statement is in the form of P ⋂ Q that has truth value True

Only when, both the components will be true.

Here,

“All living things have two eyes” is False

“All living things have two legs” is False

Hence, the given statement is False.

(iv) 2 is an even number and a prime number.

Solution:

A compound statement is a combination of two statements (Components).

So, the components of the given statement “2 is an even number and a prime number” are

p: 2 is an even number.

q: 2 is an prime number.

Now, the given compound statement is in the form of P ⋂ Q that has truth value True

Only when, both the components will be true. Here,

“2 is an even number” is true

“2 is an prime number” is true

Hence, the given statement is true.