A conditional statement has two parts;

The hypothesis follows

The conclusion follows

Conditional statement

If Phil sees his shadow, then there is an early spring.

A negation

Original statement:

Negation:

A converse of a conditional statement

If Phil sees his shadow, then there is an early spring.

An inverse of a conditional statement

If Phil sees his shadow, then there is an early spring.

A contrapositive of a conditional statement

If Phil sees his shadow, then there is an early spring.

A biconditional statement

What is the conclusion of the following conditional?
A number is divisible by 5 if the number ends with digits 0 or 5.

A. The number ends with digits 0 or 5.
B. The number is odd.
C. The number is divisible by 5.
D. If a number ends with the digit 0 or 5, then the number is divisible by 5.

Identify the hypothesis and conclusion of this conditional statement:
If yesterday was Friday, then today is Saturday.

A. Hypothesis: Yesterday was Friday.
   Conclusion: Today is not Saturday.
B. Hypothesis: Today is Saturday.
   Conclusion: Yesterday was Friday.
C. Hypothesis: Today is not Saturday.
   Conclusion: Yesterday was Friday.
D. Hypothesis: Yesterday was Friday.
   Conclusion: Today is Saturday.

Which choice shows a true conditional, with the hypothesis and conclusion identified correctly?

A. If today is Wednesday, then tomorrow is Thursday.
   Hypothesis: Tomorrow is Thursday.
   Conclusion: Today is Wednesday.
B. If today is Wednesday, then tomorrow is Thursday.
   Hypothesis: Tomorrow is Thursday.
   Conclusion: Today is not Wednesday.
C. Tomorrow is Friday if today is Wednesday.
   Hypothesis: Today is Wednesday.
   Conclusion: Tomorrow is Friday.
D. Tomorrow is Thursday if today is Wednesday.
   Hypothesis: Today is Wednesday.
   Conclusion: Tomorrow is Thursday.

Another name for an *if-then* statement is a _____. Every conditional has two parts. The part following *if* is the ____ , and the part following *then* is the ____.

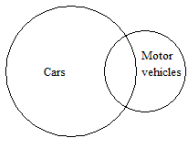
A. hypothesis; conditional; conclusion
B. conditional; conclusion; hypothesis
C. conditional; hypothesis; conclusion
D. hypothesis; conclusion; conditional

Write this statement as a conditional in *if-then* form:
All triangles have three sides.

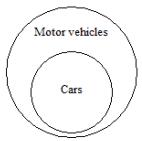
A. If a figure has three sides, then it is not a triangle.
B. If a triangle has three sides, then all triangles have three sides.
C. If a figure is a triangle, then all triangles have three sides.
D. If a figure is a triangle, then it has three sides.

Draw a Venn diagram to illustrate this conditional:
Cars are motor vehicles.

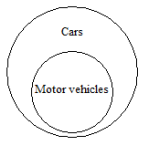
A.



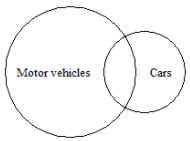
C.



B.



D.



A conditional can have a ____ of *true* or *false*.

A. counterexample
B. conclusion
C. truth value
D. hypothesis

Which statement is a counterexample for the following conditional?
If you live in Springfield, then you live in Illinois.

A. Billy Jones lives in Chicago, Illinois.
B. Erin Naismith lives in Springfield, Massachusetts.
C. Sara Lucas lives in Springfield.
D. Jonah Lincoln lives in Springfield, Illinois.

What is the converse of the following conditional?
If a point is in the fourth quadrant, then its coordinates are negative.

A. If the coordinates of a point are negative, then the point is in the fourth quadrant.
B. If the coordinates of a point are not negative, then the point is not in the fourth quadrant.
C. If a point is not in the fourth quadrant, then the coordinates of the point are not negative.
D. If a point is in the fourth quadrant, then its coordinates are negative.

Which conditional has the same truth value as its converse?

A. If an angle has a measure of 80, then it is acute.
B. If $x = 7$, then $|x| = 7$.
C. If a figure is a square, then it has four sides.
D. If $x - 17 = 4$, then $x = 21$.

For the following true conditional statement, write the converse. If the converse is also true, combine the statements as a biconditional.
If $x = 10$, then $x^2 = 100$.

A. If $x^2 = 100$, then $x = 10$. True; $x^2 = 100$ if and only if $x = 10$.
B. If $x^2 = 10$, then $x = 100$. False
C. If $x^2 = 100$, then $x = 10$. False
D. If $x^2 = 100$, then $x = 10$. True; $x = 10$ if and only if $x^2 = 100$.

What is the converse of the following true conditional? If the converse is true, rewrite the statements as a biconditional. If either is false, give a counterexample.
If two lines are parallel, they do not intersect.

A. If two lines do not intersect, they are parallel. Both statements are true. Two lines are parallel if (and only if) they do not intersect.
B. If two lines do not intersect, they are parallel. One statement is false. If two lines are parallel, they may intersect twice.
C. If two lines do not intersect, they are parallel. One statement is false. If two lines do not intersect, they could be skew.
D. If two lines do not intersect, they are not parallel. Both statements are true. Two lines are not parallel if (and only if) they do not intersect.

When a conditional and its converse are true, you can combine them as a true ____.

A. biconditional
B. unconditional
C. hypothesis
D. counterexample

Determine whether the conditional and its converse are both true. If both are true, combine them as a biconditional. If either is false, give a counterexample.
If an angle is a right angle, its measure is 90.
If an angle measure is 90, the angle is a right angle.

A. Both statements are true. An angle is a right angle if (and only if) its measure is 90.
B. One statement is false. If an angle measure is 90, the angle may be a vertical angle.
C. Both statements are true. The measure of angle is 90 if (and only if) it is not a right angle.
D. One statement is false. If an angle is a right angle, its measure may be 180.

Write the two conditional statements that make up the following biconditional.
I drink juice if (and only if) it is breakfast time.

A. I drink juice.
   It is breakfast time.
B. If I drink juice, then it is breakfast time.
   If it is breakfast time, then I drink juice.
C. If I drink juice, then it is breakfast time.
   I drink juice only if it is breakfast time.
D. I drink juice if (and only if) it is breakfast time.
   It is breakfast time if (and only if) I drink juice.

Is the following definition of *dog* reversible? If yes, write it as a true biconditional.
A dog is a mammal.

A. The reverse is false.
B. The reverse is true. An animal is a dog if (and only if) it is a mammal.
C. The reverse is true. An animal is a mammal if (and only if) it is a dog.
D. The reverse is true. If an animal is a dog, then it is a mammal.

Is the following definition of *perpendicular* reversible? If yes, write it as a true biconditional.
Two lines that intersect at right angles are perpendicular.

A. Yes; if two lines intersect at right angles, then they are perpendicular.
B. Yes; two lines intersect at right angles if (and only if) they are perpendicular.
C. Yes; if two lines are perpendicular, then they intersect at right angles.
D. The statement is not reversible.

Which biconditional is NOT a good definition?

A. Two figures are congruent if and only if their areas are equal.
B. Two line segments are congruent if and only if they are of same length.
C. An angle is straight if and only if its measure is 180.
D. A whole number is odd if and only if the number is not divisible by 2.