

## 2-3 Conditional and Biconditional Statements HW

Name

Date

Block

Master E

1-4: For each conditional statement, write the following related statements.

1. If  $2x - 1 = 5$ , then  $x = 3$ .

- a) Hypothesis:  $2x - 1 = 5$  Conclusion:  $x = 3$
- b) Converse: If  $x = 3$ , then  $2x - 1 = 5$ .
- c) Inverse: If  $2x - 1 \neq 5$ , then  $x \neq 3$ .
- d) Contrapositive: If  $x \neq 3$ , then  $2x - 1 \neq 5$

2. If I'm smart, then Mr. McHugh is a genius.

- a) Hypothesis: I'm smart Conclusion: Mr. McHugh is a genius.
- b) Converse: If Mr. McHugh is a genius, then I'm smart.
- c) Inverse: If I'm not smart, then Mr. McHugh is not a genius.
- d) Contrapositive: If Mr. McHugh is not a genius, then I'm not smart.

3. If I find the distance between 2 points, then it will always be positive.

- a) Hypothesis: I find the dist. btw 2 pts Conclusion: it will always be positive
- b) Converse: If a number is <sup>always</sup> positive, then I found the dist. btw. 2 pts.
- c) Inverse: If I don't find the dist. btw. 2 pts, then it won't always be positive.
- d) Contrapositive: If a number is not always positive, then I didn't find the distance between 2 points.

4. You can pass this class if you try harder.

- If you try harder, then you can pass this class.
- a) Hypothesis: you try harder Conclusion: you can pass this class
- b) Converse: If you can pass this class, then you tried harder.
- c) Inverse: If you don't try harder, then you can't pass this class.
- d) Contrapositive: If you can't pass this class then you didn't try harder.

5-10: Rewrite each statement below in if-then form.

5. All students love vacations.

If a person is a student, then he or she loves vacations.

6. He will drive provided it does not snow.

If it does not snow, then he will drive.

7. Dogs have fur.

If an animal is a dog, then it has fur.

8. You will be in good shape if you exercise regularly.

If you exercise regularly, then you will be in good shape.

9. Acute angles have a measure of less than  $90^\circ$ .

If an angle is acute, then it has a measure of less than  $90^\circ$ .

10. I go hiking whenever it isn't raining.

If it isn't raining, then I will go hiking.

11-16: Write the converse of each true statement. If the converse is also true, combine the statements to write a true biconditional statement.

11. If an angle measures  $30^\circ$ , then it is acute. (T)

a) Converse: If an angle is acute, then it measures  $30^\circ$ . (F)

b) Biconditional: Not true: it could be  $40^\circ$ !

12. If today is Friday, then tomorrow is Saturday. (T)

a) Converse: If tomorrow is Saturday, then today is Friday. (T)

b) Biconditional: Today is Friday iff tomorrow is Saturday.

13. If two angles are congruent, then they have the same measure. (T)

a) Converse: If two angles have the same measure, then they are congruent. (T)

b) Biconditional: Two angles are congruent iff they have the same measure.

14. If  $3x - 5 = 4$ , then  $x = 3$ . (T)

a) Converse: If  $x = 3$ , then  $3x - 5 = 4$ . (T)

b) Biconditional:  $3x - 5 = 4$  iff  $x = 3$ .

15. If a person is 6' tall, then they have a height of 72". (T)

a) Converse: If a person has a height of 72", then he/she is 6' tall. (T)

b) Biconditional: A person is 6' tall iff they have a height of 72".

16. If  $x = -7$ , then  $x^2 = 49$ . (T)

a) Converse: If  $x^2 = 49$ , then  $x = -7$ . (F)

b) Biconditional:  $x$  could also equal  $+7$ !