

# Chapter 2 Answers

## Practice 2-1

1. Sample: It is 12:00 noon on a rainy day. 2. Sample: The car will not start because of a dead battery. 3. Sample: 6
4. If you are strong, then you drink milk. 5. If a rectangle is a square, then it has four sides the same length.
6. If you are tired, then you did not sleep. 7. If  $x = 26$ , then  $x - 4 = 22$ ; true. 8. If  $x > 0$ , then  $|x| > 0$ ; true. 9. If  $m$  is positive, then  $m^2$  is positive; true.
10. If  $2y - 1 = 5$ , then  $y = 3$ ; true. 11. If  $x > 0$ , then point  $A$  is in the first quadrant; false;  $(4, -5)$  is in the fourth quadrant. 12. If lines are parallel, then their slopes are equal; true. 13. If you have a sibling, then you are a twin; false; a brother or sister born on a different day.

14.



15. Hypothesis: If you like to shop; conclusion: Visit Pigeon Forge outlets in Tennessee. 16. Pigeon Forge outlets are good for shopping. 17. If you visit Pigeon Forge outlets, then you like to shop. 18. It is not necessarily true. People may go to Pigeon Forge outlets because the people they are with want to go there. 19. Drinking Sustain makes you train harder and run faster. 20. If you drink Sustain, then you will train harder and run faster. 21. If you train harder and run faster, then you drink Sustain.

## Practice 2-2

1. Two angles have the same measure if and only if they are congruent. 2.  $2x - 5 = 11$  if and only if  $x = 8$ .
3. The converse, "If  $|n| = 17$ , then  $n = 17$ ," is not true.
4. A figure has eight sides if and only if it is an octagon.
5. If a whole number is a multiple of 5, then its last digit is either 0 or 5. If a whole number has a last digit of 0 or 5, then it is a multiple of 5. 6. If two lines are perpendicular, then the lines form four right angles. If two lines form four right angles, then the lines are perpendicular. 7. If you live in Texas, then you live in the largest state in the contiguous United States. If you live in the largest state in the contiguous United States, then you live in Texas. 8. Sample: Other vehicles, such as trucks, fit this description. 9. Sample: Other objects, such as spheres, are round. 10. Sample: This is not specific enough; many numbers in a set could fit this description. 11. Sample: Baseball also fits this definition. 12. Sample: *Pleasing*, *smooth*, and *rigid* all are too vague. 13. yes 14. no 15. yes

## Practice 2-3

1.  $\angle A$  and  $\angle B$  are complementary. 2. Football practice is canceled for Monday. 3.  $\triangle DEF$  is a right triangle.
4. If you liked the movie, then you enjoyed yourself.
5. If two lines are not parallel, then they intersect at a point.
6. If you vacation at the beach, then you like Florida.
7. not possible 8. Tamika lives in Nebraska.

9. not possible 10. It is not freezing outside.
11. Shannon lives in the smallest state in the United States.
12. On Thursday, the track team warms up by jogging 2 miles.

## Practice 2-4

1.  $UT = MN$  2.  $m\angle QWR = 30$  3.  $SB = MN$
4.  $y = 51$  5.  $\overline{JL}$  6. Given; Addition Property of Equality; Division Property of Equality 7. Given; Addition; Subtraction Property of Equality; Multiplication Property of Equality; Division Property of Equality
8. Substitution 9. Substitution 10. Transitive Property of Equality 11. Symmetric Property of Congruence 12. Transitive Property of Congruence
13. Definition of Complementary Angles; 90; Substitution;  $3x$ , Simplify;  $3x$ , 84, Subtraction Property of Equality; 28, Division Property of Equality 14. Given;  $(2x - 4)$ , Substitution;  $6x - 12$ , Distributive Property;  $-x$ , Subtraction Property of Equality; 12, Multiplication Property of Equality

## Practice 2-5

1. 30 2. 15 3. 20 4. 6 5. 16 6. 9
7. false 8. true 9. true 10. true 11. false
12. false 13.  $m\angle PMO = 55$ ;  $m\angle PMQ = 125$ ;  $m\angle QMN = 55$  14.  $m\angle BOD = m\angle COE = 90$ ;  $m\angle BOC = m\angle COD = 45$ ;  $m\angle AOB = m\angle DOE = 45$
15.  $m\angle BWC = m\angle CWD$ ,  $m\angle AWB + m\angle BWC = 180$ ;  $m\angle CWD + m\angle DWA = 180$ ;  $m\angle AWB = m\angle AWD$

## Reteaching 2-1

- 1-3. Check students' work. 4. If you hear thunder, then you see lightning; statement: false; converse: false.
5. If your pants are jeans, then they are blue; statement: false; converse: false. 6. If you are eating a tangerine, then you are eating an orange fruit; statement: false; converse: true.
7. If a number is an integer, then it is a whole number; statement: true; converse: false. 8. If a triangle has one angle greater than  $90^\circ$ , then it is an obtuse triangle; statement: true; converse: true. 9. If  $n^2 = 64$ , then  $n = 8$ ; statement: true; converse: false. 10. If you got an A for the quarter, then you got an A on the first test; statement: false; converse: false. 11. If a figure has four sides, then it is a square; statement: true; converse: false. 12. If  $x = 144$ , then  $\sqrt{x} = 12$ ; statement: true; converse: true.

## Reteaching 2-2

1. If  $n = 15$  or  $n = -15$ , then  $|n| = 15$ . If  $|n| = 15$ , then  $n = 15$  or  $n = -15$ . 2. If two segments are congruent, then they have the same measure. If two segments have the same measure, then they are congruent. 3. If you live in California, then you live in the most populated state in the United States. If you live in the most populated state in the United States, then you live in California. 4. If an integer is a multiple of 10, then its last digit is 0. If an integer's last digit is 0, then it is a multiple of 10. 5. No; counter-examples may vary. Sample: A giraffe is a large animal.

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# Chapter 2 Answers (continued)

use the definition of supplementary angles and the subtraction property to show that they are equal. 4. 90 5. 135  
6. 45 7.  $\overline{NO}$  bisects  $\overline{TP}$ ; a segment that is perpendicular to another segment at its midpoint is the perpendicular bisector of the segment.

## Chapter Project

Check students' work.

### ✓ Checkpoint Quiz 1

1. hypothesis:  $x + 4 = 10$ ; conclusion:  $x = 6$
2. hypothesis: if you want to get good grades in school; conclusion: you must study hard 3. Sample: It could be May. 4. Sample: Corn is a vegetable. 5. No; the lines must be in the same plane. 6. yes 7. not possible
8.  $X$ ,  $Y$ , and  $Z$  are coplanar. 9. If you ran a good race, then your coach is happy. 10. If the car is old, then it is not efficient.

### ✓ Checkpoint Quiz 2

1.  $4x = 13$  2.  $\angle TQM \cong \angle LTS$  3. Symmetric Property 4. Substitution Property 5. Division Property 6. Addition Property 7.  $\angle 1 \cong \angle 3$ ,  $\angle 2 \cong \angle 4$ ; Vertical Angles Theorem 8.  $\angle 2 \cong \angle 3$ ,  $\angle 1 \cong \angle 4$ ; Linear Pair and Transitive Property of Equality 9.  $\angle 1 \cong \angle 4$ ,  $\angle 2 \cong \angle 3$ ; Subtraction Property of Equality 10.  $\angle 1 \cong \angle 2$ ,  $\angle 3 \cong \angle 4$ ; Vertical Angles Theorem

## Chapter Test, Form A

- 1a. If a polygon has three sides, then it is a triangle.
- 1b. true 2a. If George lives in the United States, then he lives in Texas. 2b. false 3a. If two angles are congruent, then they are vertical angles. 3b. false
4. Addition Property of Equality 5. Transitive Property of Equality 6. Subtraction Property of Equality 7. Division Property of Equality 8. Reflexive Property of Equality 9a. 90 9b. 58 9c. 148 9d. 90 9e. 122 9f. 148 10. 17 11. 6 12. 14 13. 11 14. not possible 15. We win. 16. If the bus is late, then we will receive a tardy penalty. 17. The sum of the measures of  $\angle A$  and  $\angle B$  is 90. 18. If a quadrilateral is a rectangle, then it has four right angles. If a quadrilateral has four right angles, then it is a rectangle. 19. A rhombus has four congruent sides. 20. good definition 21. good definition 22. A bat has wings. 23a. Distributive Property 23b. Addition Property of Equality 23c. Division Property of Equality 24. 58 25. 43 26. 66 27. 152 28. 36 29. 60 30. 30

## Chapter Test, Form B

- 1a. If a polygon has five sides, then it is a pentagon.
- 1b. true 2a. If Mary lives in Minnesota, then she lives in Minneapolis. 2b. false 3a. If the sum of two angles is 180, then they are supplements. 3b. true 4. Reflexive Property of Equality 5. Substitution Property of Equality

6. Addition Property of Equality 7. Division Property of Equality 8. Distributive Property 9a. 90 9b. 38 9c. 128 9d. 142 9e. 26 9f. 154 10. 50 11. 13.5 12. 4 13. 180 14. not possible 15. Martina is quick. 16. If I don't wear sunscreen while swimming, then I'll be in pain. 17.  $\angle A$  and  $\angle B$  are congruent. 18. If a quadrilateral is a parallelogram, then it has two pairs of opposite sides parallel. If a quadrilateral has two pairs of opposite sides parallel, then it is a parallelogram. 19. A rectangle has four right angles. 20. Two congruent and adjacent angles may have the same measure and not be vertical. 21. good definition 22. An octopus has eight legs. 23a. Division Property of Equality 23b. Subtraction Property of Equality 23c. Division Property of Equality 24. 7 25. 23 26. 49 27. 117 28. 30 29. 102 30. 45

## Alternative Assessment, Form C

### TASK 1: Scoring Guide

- a. Sample: If it is raining, then the lawn is wet.
- b. Sample: If the temperature is below  $32^{\circ}\text{F}$ , then the temperature is below freezing.

- 3 Student gives conditionals that meet the criteria and provides clear and accurate explanations of why the conditionals meet the criteria.
- 2 Student gives examples and explanations that are generally clear but may contain errors.
- 1 Student makes significant errors in examples or explanations.
- 0 Student makes little or no attempt.

### TASK 2: Scoring Guide

Sample: The definition cannot be written as a biconditional. A school is a place where people are educated.

- 3 Student gives an explanation and a definition that are accurate, clear, and complete.
- 2 Student gives an explanation and a definition that are generally clear but may contain errors.
- 1 Student makes significant errors in explanation or definition.
- 0 Student makes little or no attempt.

### TASK 3: Scoring Guide

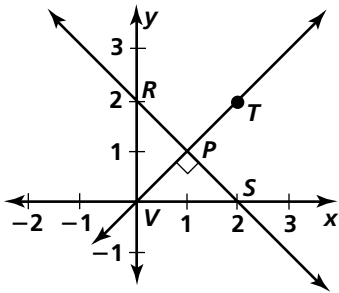
- a. Sample: If two angles have sides that are opposite rays, then they are vertical angles.  $\angle CEF$  and  $\angle GED$  are angles whose sides are opposite rays. Therefore,  $\angle CEF$  and  $\angle GED$  are vertical angles.
- b. Sample:  $\angle CEF$  and  $\angle GED$  are vertical angles. All vertical angles are congruent. Therefore,  $\angle CEF \cong \angle GED$ .

- 3 Student gives accurate and complete examples and explanations of the Laws of Detachment and Syllogism.
- 2 Student gives examples and explanations that are generally correct but may be unclear.
- 1 Student gives examples or explanations that contain major errors.
- 0 Student makes little or no attempt.

# Chapter 2 Answers (continued)

## TASK 4: Scoring Guide

Sample:



- a.  $\angle TPR$  and  $\angle RPV$ ;  $\angle RPV$  and  $\angle VPS$ ;  $\angle VPS$  and  $\angle SPT$ ;  $\angle SPT$  and  $\angle TPR$ ;  $\angle RPT$  and  $\angle VPS$ ;  $\angle TPS$  and  $\angle RPV$
- b.  $\angle RPT$  and  $\angle VPS$ ;  $\angle TPS$  and  $\angle RPV$
- c.  $\angle RPT$  is a right angle because the lines are perpendicular, so  $m\angle RPT = 90$ . Therefore, if ray  $PY$  bisects  $\angle RPT$ ,  $m\angle YPR = 45$ .

- 3 Student draws a diagram and gives responses that indicate a thorough understanding of the definitions involved. Student shows logic in part c that is complete and accurate.
- 2 Student draws a diagram and gives responses that, while basically accurate, contain some minor flaws, inaccuracies, or omissions.
- 1 Student draws a diagram or gives responses that contain significant inaccuracies or omissions. Student displays flaws in logical argument in part c.
- 0 Student makes little or no attempt.

## Cumulative Review

1. B    2. A    3. C    4. B    5. A    6. C    7. C  
8. A    9. D    10. B    11. C    12. D    13. C  
14. 17    15. If a polygon has three sides, then it is a triangle; true.    16.  $196\pi \text{ m}^2$     17. Sample: Two supplementary angles are not necessarily a linear pair.  
18.  $\overleftrightarrow{BC}$     19. Substitution Property of Equality  
20.  $(-1, 2)$     21.  $(-2, 2)$     22.  $\sqrt{145}$     23. 4  
24.  $60 \text{ m}^2$     25.  $380.13 \text{ cm}^2$     26. Sample: A midpoint must be on the segment. Any point that lies on the perpendicular bisector of a segment is equidistant from the endpoints.