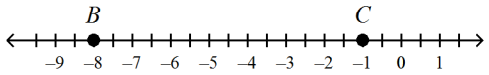
Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Geometry Midterm Review 19-20

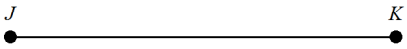
Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Find the length of $\overline{BC}$.

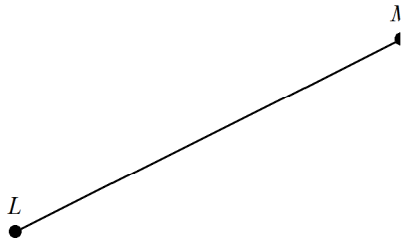


a. $BC = -7$
b. $BC = -9$
c. $BC = 7$
d. $BC = 8$

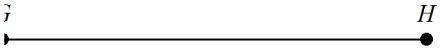
____ 2. Find the best sketch, drawing, or construction of a segment congruent to $\overline{JK}$.



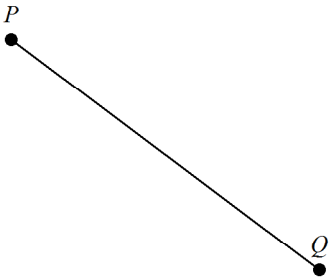
a.



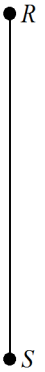
c.



b.

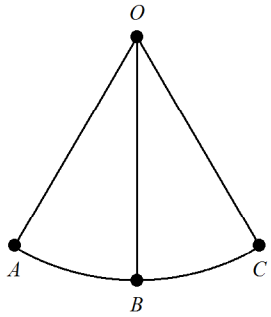


d.



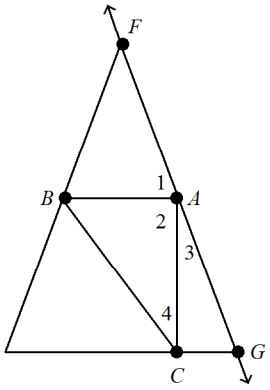
____ 3. K is the midpoint of $\overline{JL}$. $JK = 6x$ and $KL = 3x + 3$. Find JK, KL, and JL.
a. $JK = 1$, $KL = 1$, $JL = 2$
b. $JK = 6$, $KL = 6$, $JL = 12$
c. $JK = 12$, $KL = 12$, $JL = 6$
d. $JK = 18$, $KL = 18$, $JL = 36$

____ 4. The tip of a pendulum at rest sits at point *B*. During an experiment, a physics student sets the pendulum in motion. The tip of the pendulum swings back and forth along part of a circular path from point *A* to point *C*. During each swing the tip passes through point *B*. Name all the angles in the diagram.



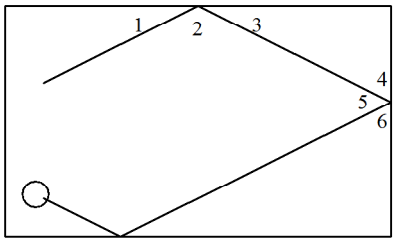
a. $\angle AOB$, $\angle BOC$
b. $\angle AOB$, $\angle COB$, $\angle AOC$
c. $\angle AOB$, $\angle BOA$, $\angle COB$, $\angle BOC$
d. $\angle OAB$, $\angle OBC$, $\angle OCB$

____ 5. Tell whether $\angle 1$ and $\angle 3$ are only adjacent, adjacent and form a linear pair, or not adjacent.



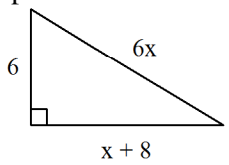
a. not adjacent
b. only adjacent
c. adjacent and form a linear pair

____ 6. A billiard ball bounces off the sides of a rectangular billiards table in such a way that $\angle 1 \cong \angle 3$, $\angle 4 \cong \angle 6$, and $\angle 3$ and $\angle 4$ are complementary. If $m\angle 1 = 26.5°$, find $m\angle 3$, $m\angle 4$, and $m\angle 5$.



a. $m\angle 3 = 26.5°$; $m\angle 4 = 63.5°$; $m\angle 5 = 63.5°$
b. $m\angle 3 = 26.5°$; $m\angle 4 = 63.5°$; $m\angle 5 = 53°$
c. $m\angle 3 = 63.5°$; $m\angle 4 = 26.5°$; $m\angle 5 = 53°$
d. $m\angle 3 = 26.5°$; $m\angle 4 = 153.5°$; $m\angle 5 = 26.5°$

____ 7. Find the perimeter and area of the figure.



a. perimeter = $6x^2 + 14$;
area = $3x + 24$
b. perimeter = $7x + 14$;
area = $3x + 24$
c. perimeter = $7x + 14$;
area = $6x + 48$
d. perimeter = $7x + 14$;
area = $6x^2 + 14$

____ 8. M is the midpoint of $\overline{AN}$, A has coordinates (–6, –6), and M has coordinates (1, 2). Find the coordinates of N.

a. (8, 10)
b. (–5, –4)
c. $(-2\frac{1}{2}, -2)$
d. $(8\frac{1}{2}, 9\frac{1}{2})$

____ 9. Use the Distance Formula and the Pythagorean Theorem to find the distance, to the nearest tenth, from $T(4, -2)$ to $U(-2, 3)$.

a. –1.0 units
b. 3.4 units
c. 0.0 units
d. 7.8 units

____ 10. Complete the conjecture.
The sum of two odd numbers is _____.

a. even
b. odd
c. sometimes odd, sometimes even
d. even most of the time

____ 11. Show that the conjecture is false by finding a counterexample.

If $a > b$, then $\frac{a}{b} > 0$.

a. $a = 11$, $b = -3$
b. $a = 11$, $b = 3$
c. $a = 3$, $b = 11$
d. $a = -11$, $b = 3$

____ 12. How many true conditional statements may be written using the following statements?
n is a rational number.
n is an integer.
n is a whole number.

a. 2 conditional statements
b. 3 conditional statements
c. 4 conditional statements
d. 5 conditional statements

____ 13. What is the truth value of the biconditional formed from the conditional, "If *B* is the midpoint of *A* and *C*, then *AB* = *BC*." Explain.

a. The conditional is true.
The converse, "If *AB* = *BC* then *B* is the midpoint of $\overline{AC}$" is false.
Since the conditional is true but the converse is false, the biconditional is false.

b. The conditional is true.
The converse, "If *AB* = *BC* then *B* is the midpoint of $\overline{AC}$" is true.
Since the conditional is true and the converse is true, the biconditional is true.

c. The conditional is false.
The converse, "If *AB* = *BC* then *B* is the midpoint of $\overline{AC}$" is false.
Since the conditional is false and the converse is false, the biconditional is true.

d. The conditional is false.
The converse, "If *AB* = *BC* then *B* is the midpoint of $\overline{AC}$" is true.
Since the conditional is false and the converse is true, the biconditional is false.

____ 14. A gardener has 26 feet of fencing for a garden. To find the width of the rectangular garden, the gardener uses the formula $P = 2l + 2w$, where P is the perimeter, l is the length, and w is the width of the rectangle. The gardener wants to fence a garden that is 8 feet long. How wide is the garden? Solve the equation for w, and justify each step.

$P = 2l + 2w$	Given equation
$26 = 2(8) + 2w$	[1]
$26 = 16 + 2w$	Simplify.
$\underline{-16} = \underline{-16}$	Subtraction Property of Equality
$10 = 2w$	Simplify.
$\frac{10}{2} = \frac{2w}{2}$	[2]
$5 = w$	Simplify.
$w = 5$	Symmetric Property of Equality

a. [1] Substitution Property of Equality
[2] Division Property of Equality
The garden is 5 ft wide.

b. [1] Simplify
[2] Division Property of Equality
The garden is 5 ft wide.

c. [1] Substitution Property of Equality
[2] Subtraction Property of Equality
The garden is 5 ft wide.

d. [1] Subtraction Property of Equality
[2] Simplify
The garden is 5 ft wide.

____ 15. Two angles with measures $(2x^2 + 3x - 5)°$ and $(x^2 + 11x - 7)°$ are supplementary. Find the value of x and the measure of each angle.

a. $x = 5$; 60°; 30°
c. $x = 5$; 60°; 120°
b. $x = 6$; 85°; 95°
d. $x = 4$; 40°; 90°

____ 16. Use p and q to find the truth value of the compound statement $p \wedge q$.

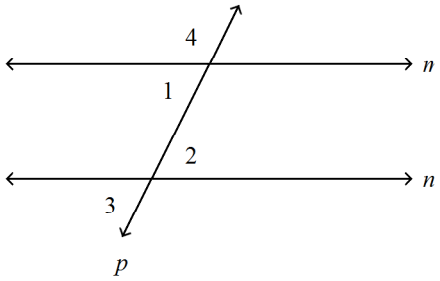
p : Blue is a color.

q : The sum of the measures of the angles of a triangle is 160°.

a. Since p is true, the conjunction is true.
b. Since q is true, the conjunction is true.
c. Since p and q are true, the conjunction is true.
d. Since q is false, the conjunction is false.

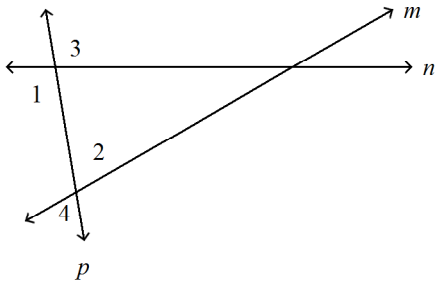
____ 17. Draw two lines and a transversal such that ∠1 and ∠2 are alternate interior angles, ∠2 and ∠3 are corresponding angles, and ∠3 and ∠4 are alternate exterior angles. What type of angle pair is ∠1 and ∠4?

a.



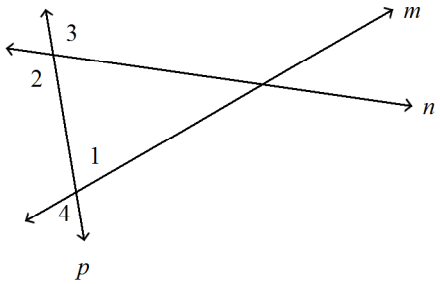
∠1 and ∠4 are supplementary angles.

b.



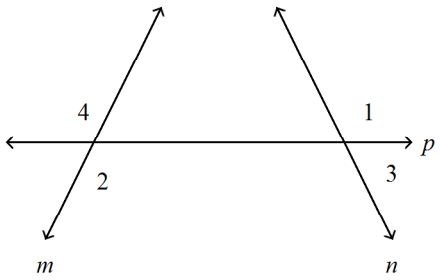
∠1 and ∠4 are corresponding angles.

c.



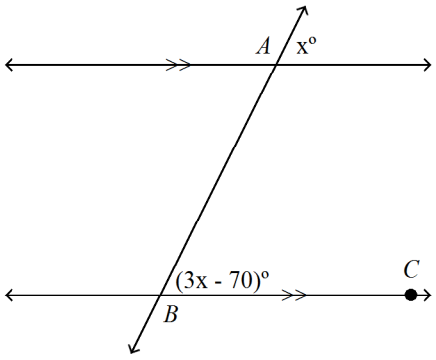
∠1 and ∠4 are vertical angles.

d.



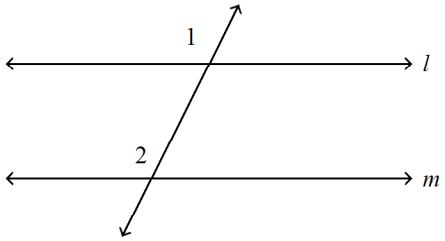
∠1 and ∠4 are alternate exterior angles.

____ 18. Find m∠*ABC*.



a. m∠*ABC* = 40°
b. m∠*ABC* = 45°
c. m∠*ABC* = 35°
d. m∠*ABC* = 50°

____ 19. Use the Converse of the Corresponding Angles Postulate and ∠1 ≅ ∠2 to show that $l \parallel m$.



a. ∠1 ≅ ∠2 is given. From the diagram, ∠1 and ∠2 are corresponding angles. So by the Converse of the Corresponding Angles Postulate, $l \parallel m$.
b. ∠1 ≅ ∠2 is given. From the diagram, ∠1 and ∠2 are alternate interior angles. So by the Converse of the Alternate Interior Angles Postulate, $l \parallel m$.
c. By the Converse of the Corresponding Angles Postulate, ∠1 ≅ ∠2. From the diagram, $l \parallel m$.
d. ∠1 ≅ ∠2 is given. From the diagram, ∠1 and ∠2 are corresponding angles. So by the Corresponding Angles Postulate, $l \parallel m$.

____ 20. Write the equation of the line with slope 2 through the point (4, 7) in point-slope form.

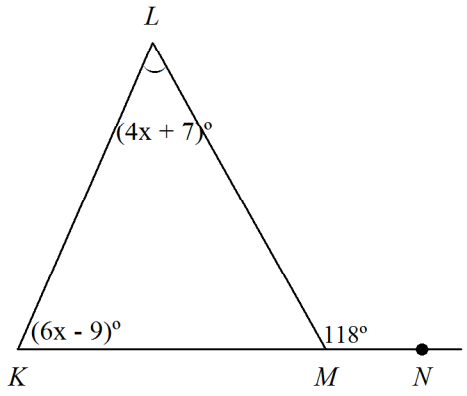
a. $y = 2x - 1$
b. $y = 2x + 7$
c. $y - 4 = 2(x - 7)$
d. $y - 7 = 2(x - 4)$

____ 21. Both stores see the same number of people. How many customers must both stores have before the total amount of money they have is equal?

	Jala's Yogurt Shop	**Ela's Salad Store**
Starting Money	$20	$30
Money per Customer	$6	$4

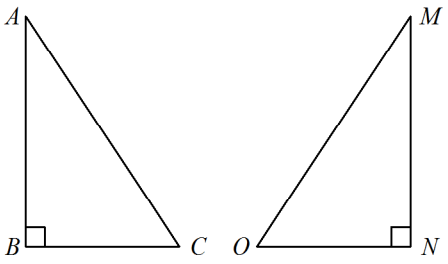
a. 5 customers
b. $50
c. 20 cents
d. 20 customers

____ 22. Find m$\angle K$.



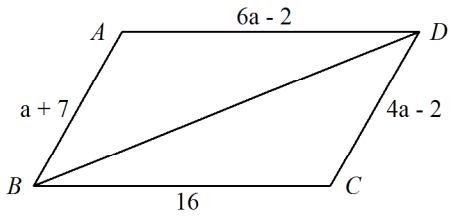
a. m$\angle K = 63°$
b. m$\angle K = 55°$
c. m$\angle K = 79°$
d. m$\angle K = 39°$

____ 23. **Given**: $\Delta ABC \cong \Delta MNO$
Identify all pairs of congruent corresponding parts.



a. $\angle A \cong \angle M, \angle B \cong \angle N, \angle C \cong \angle O, \overline{AB} \cong \overline{MN}, \overline{BC} \cong \overline{NO}, \overline{AC} \cong \overline{MO}$
b. $\angle A \cong \angle M, \angle B \cong \angle O, \angle C \cong \angle N, \overline{AB} \cong \overline{MN}, \overline{BC} \cong \overline{NO}, \overline{AC} \cong \overline{MO}$
c. $\angle A \cong \angle M, \angle B \cong \angle N, \angle C \cong \angle O, \overline{AB} \cong \overline{MO}, \overline{BC} \cong \overline{NO}, \overline{AC} \cong \overline{MN}$
d. $\angle A \cong \angle O, \angle B \cong \angle N, \angle C \cong \angle M, \overline{AB} \cong \overline{NO}, \overline{BC} \cong \overline{MN}, \overline{AC} \cong \overline{MO}$

____ 24. Show $\Delta ABD \cong \Delta CDB$ for $a = 3$.



Complete the proof.

$AB = a + 7 = [1] = 10$
$CD = 4a - 2 = [2] = 12 - 2 = 10$
$AD = 6a - 2 = 6(3) - 2 = 18 - 2 = [3]$
$CB = [4]$
$\overline{AB} \cong \overline{CD}$. $\overline{AD} \cong \overline{CB}$. $\overline{BD} \cong \overline{BD}$ by the Reflexive Property of Congruence. So $\Delta ABD \cong \Delta CDB$ by [5].

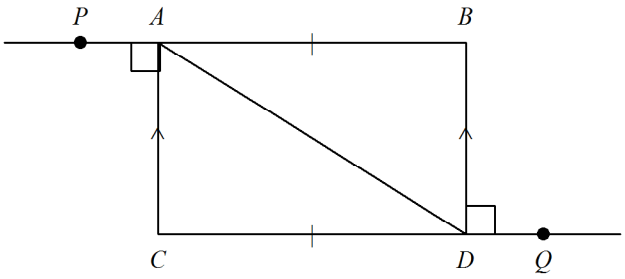
a. [1] $a + 7$
[2] $4a - 2$
[3] 16
[4] 16
[5] SAS

b. [1] $3 + 7$
[2] $4(3) - 2$
[3] 26
[4] 26
[5] SSS

c. [1] $3 + 7$
[2] $4(3) - 2$
[3] 16
[4] 16
[5] SAS

d. [1] $3 + 7$
[2] $4(3) - 2$
[3] 16
[4] 16
[5] SSS

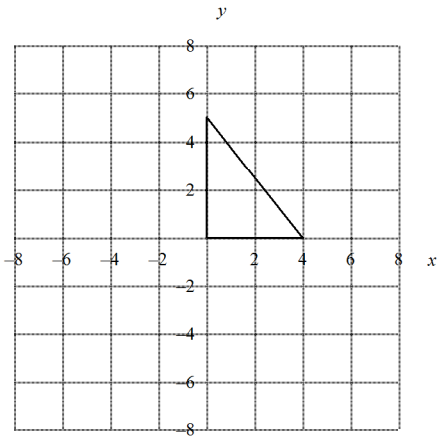
____ 25. Determine if you can use the HL Congruence Theorem to prove $\Delta ACD \cong \Delta DBA$. If not, tell what else you need to know.



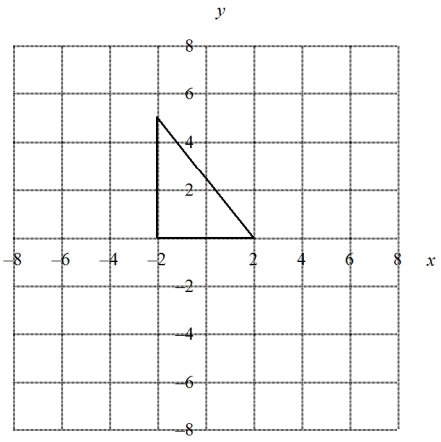
a. Yes.
b. No. You do not know that $\angle C$ and $\angle B$ are right angles.
c. No. You do not know that $\overline{AC} \cong \overline{BD}$.
d. No. You do not know that $\overline{AB} \parallel \overline{CD}$.

____ 26. Which of the following is **not** a positioning of a right triangle with leg lengths of 4 units and 5 units?

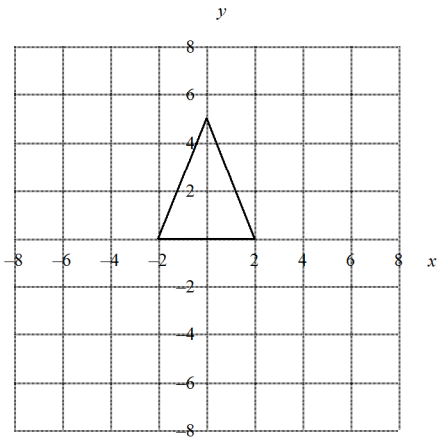
a.



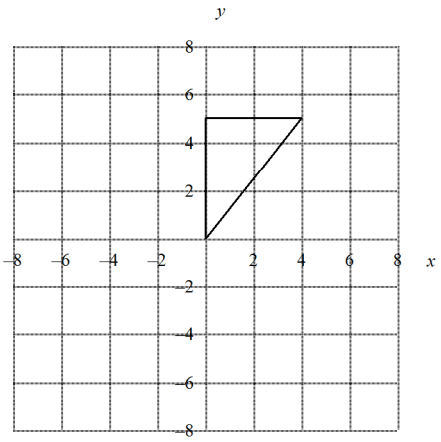
c.



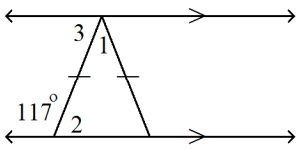
b.



d.



____ 27. Find the measure of each numbered angle.

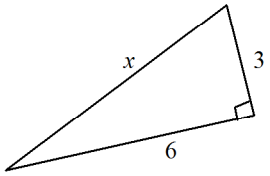


a. m∠1 = 54°, m∠2 = 117°, m∠3 = 63°
b. m∠1 = 117°, m∠2 = 63°, m∠3 = 63°
c. m∠1 = 54°, m∠2 = 63°, m∠3 = 63°
d. m∠1 = 54°, m∠2 = 63°, m∠3 = 117°

____ 28. Find the orthocenter of ΔABC with vertices $A(1, -3), B(2, 7)$, and $C(-2, -3)$.

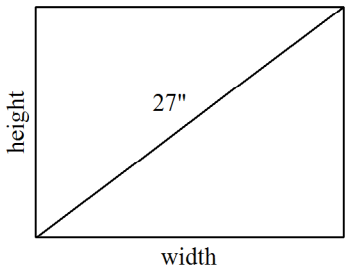
a. $\left(2, -\frac{17}{5}\right)$
b. $\left(2, -\frac{13}{5}\right)$
c. $\left(2, -\frac{16}{5}\right)$
d. $\left(2, -\frac{11}{5}\right)$

____ 29. Find the value of x. Express your answer in simplest radical form.



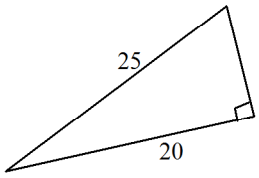
a. $x = 3\sqrt{5}$
b. $x = 9\sqrt{5}$
c. $x = 3\sqrt{3}$
d. $x = 5\sqrt{3}$

____ 30. The size of a TV screen is given by the length of its diagonal. The screen aspect ratio is the ratio of its width to its height. The screen aspect ratio of a standard TV screen is 4:3. What are the width and height of a 27" TV screen?



a. width: 21.6 in., height: 16.2 in.
b. width: 16.2 in., height: 21.6 in.
c. width: 21.6 in., height: 5.4 in.
d. width: 5.4 in., height: 21.6 in.

____ 31. Find the missing side length. Tell if the side lengths form a Pythagorean triple. Explain.



a. The missing side length is 15. The side lengths form a Pythagorean triple because they are nonzero whole numbers that satisfy the equation $a^2 + b^2 = c^2$.
b. The missing side length is 32.02. The side lengths do not form a Pythagorean triple because one of them is not a nonzero whole number.
c. The missing side length is 5. The side lengths form a Pythagorean triple because they are nonzero whole numbers that satisfy the equation $a^2 + b^2 = c^2$.
d. The missing side length is 32.02. The side lengths form a Pythagorean triple because they satisfy the equation $a^2 + b^2 = c^2$.

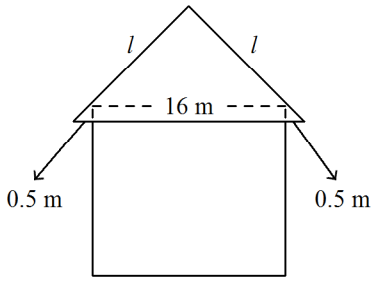
____ 32. Tell if the measures 6, 14, and 13 can be side lengths of a triangle. If so, classify the triangle as acute, right, or obtuse.

a. Yes; acute triangle
b. Yes; obtuse triangle
c. Yes; right triangle
d. No.

____ 33. Find all the values of k so that $(-3, 4)$, $(-8, 5)$, and $(-5, k)$ are the vertices of a right triangle.

a. $k = -6, 1, 9, 20$
b. $k = -5, 2, 7, 19$
c. $k = -5, 1, 9, 19$
d. $k = -6, 2, 7, 20$

____ 34. An architect designs the front view of a house with a gable roof that has a 45°-45°-90° triangle shape. The overhangs are 0.5 meter each from the exterior walls, and the width of the house is 16 meters. What should the side length l of the triangle be? Round your answer to the nearest meter.



a. 12 m
b. 11 m
c. 24 m
d. 23 m

Geometry Midterm Review 19-20
Answer Section

MULTIPLE CHOICE

1. ANS: C REF: 19313ea6-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-2.1 Finding the Length of a Segment
   TOP: 1-2 Measuring and Constructing Segments
2. ANS: B REF: 193379f2-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-2.2 Copying a Segment TOP: 1-2 Measuring and Constructing Segments
3. ANS: B REF: 19383eaa-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-2.5 Using Midpoints to Find Lengths
   TOP: 1-2 Measuring and Constructing Segments
4. ANS: B REF: 193aa106-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-3.1 Naming Angles TOP: 1-3 Measuring and Constructing Angles
5. ANS: A REF: 1941c81a-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-4.1 Identifying Angle Pairs TOP: 1-4 Pairs of Angles
6. ANS: B REF: 1949163e-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-4.4 Problem-Solving Application TOP: 1-4 Pairs of Angles
7. ANS: B REF: 194b789a-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-5.1 Finding Perimeter and Area TOP: 1-5 Using Formulas in Geometry
8. ANS: A REF: 1954dafa-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-6.2 Finding the Coordinates of an Endpoint
   TOP: 1-6 Midpoint and Distance in the Coordinate Plane
9. ANS: D REF: 19573d56-4683-11df-9c7d-001185f0d2ea
   OBJ: 1-6.4 Finding Distances in the Coordinate Plane
   TOP: 1-6 Midpoint and Distance in the Coordinate Plane
10. ANS: A REF: 19c02526-4683-11df-9c7d-001185f0d2ea
    OBJ: 2-1.2 Making a Conjecture TOP: 2-1 Using Inductive Reasoning to Make Conjectures
11. ANS: A REF: 19c2ae92-4683-11df-9c7d-001185f0d2ea
    OBJ: 2-1.4 Finding a Counterexample TOP: 2-1 Using Inductive Reasoning to Make Conjectures
12. ANS: B REF: 19cc3802-4683-11df-9c7d-001185f0d2ea
    TOP: 2-2 Conditional Statements
13. ANS: A REF: 19dcc176-4683-11df-9c7d-001185f0d2ea
    TOP: 2-4 Biconditional Statements and Definitions
14. ANS: A REF: 19df23d2-4683-11df-9c7d-001185f0d2ea
    OBJ: 2-5.2 Problem-Solving Application TOP: 2-5 Algebraic Proof
15. ANS: B REF: 19e8ad42-4683-11df-9c7d-001185f0d2ea
    TOP: 2-6 Geometric Proof
16. ANS: D REF: 19f236b2-4683-11df-9c7d-001185f0d2ea
    OBJ: 2-7-Ext.1 Analyzing Truth Values of Conjunctions and Disjunctions
    TOP: 2-7-Ext. Introduction to Symbolic Logic
17. ANS: B REF: 1a220cf2-4683-11df-9c7d-001185f0d2ea
    TOP: 3-1 Lines and Angles

18. ANS: C REF: 1a24483e-4683-11df-9c7d-001185f0d2ea
OBJ: 3-2.1 Using the Corresponding Angles Postulate
TOP: 3-2 Angles Formed by Parallel Lines and Transversals
19. ANS: A REF: 1a2b6f52-4683-11df-9c7d-001185f0d2ea
OBJ: 3-3.1 Using the converse of the Corresponding Angles Postulate
TOP: 3-3 Proving Lines Parallel
20. ANS: D REF: 1a3e8232-4683-11df-9c7d-001185f0d2ea
OBJ: 3-6.1 Writing Equations of Lines TOP: 3-6 Lines in the Coordinate Plane
21. ANS: A REF: 1a4346ea-4683-11df-9c7d-001185f0d2ea
OBJ: 3-6.4 Problem-Solving Application TOP: 3-6 Lines in the Coordinate Plane
22. ANS: A REF: 1a6bcf06-4683-11df-9c7d-001185f0d2ea
OBJ: 4-3.3 Applying the Exterior Angle Theorem
TOP: 4-3 Angle Relationships in Triangles
23. ANS: A REF: 1a7093be-4683-11df-9c7d-001185f0d2ea
OBJ: 4-4.1 Naming Congruent Corresponding Parts TOP: 4-4 Congruent Triangles
24. ANS: D REF: 1a7c7f8a-4683-11df-9c7d-001185f0d2ea
OBJ: 4-5.3 Verifying Triangle Congruence
TOP: 4-5 Triangle Congruence: SSS and SAS
25. ANS: A REF: 1a8608fa-4683-11df-9c7d-001185f0d2ea
OBJ: 4-6.4 Applying HL Congruence TOP: 4-6 Triangle Congruence: ASA, AAS, and HL
26. ANS: B REF: 1a8fb97a-4683-11df-9c7d-001185f0d2ea
OBJ: 4-8.1 Positioning a Figure in the Coordinate Plane
TOP: 4-8 Introduction to Coordinate Proof
27. ANS: C REF: 1a9de092-4683-11df-9c7d-001185f0d2ea
TOP: 4-9 Isosceles and Equilateral Triangles
28. ANS: A REF: 1ade6756-4683-11df-9c7d-001185f0d2ea
OBJ: 5-3.3 Finding the Orthocenter TOP: 5-3 Medians and Altitudes of Triangles
29. ANS: A REF: 1af8a14a-4683-11df-9c7d-001185f0d2ea
OBJ: 5-7.1 Using the Pythagorean Theorem TOP: 5-7 The Pythagorean Theorem
30. ANS: A REF: 1afadc96-4683-11df-9c7d-001185f0d2ea
OBJ: 5-7.2 Application TOP: 5-7 The Pythagorean Theorem
31. ANS: A REF: 1afd3ef2-4683-11df-9c7d-001185f0d2ea
OBJ: 5-7.3 Identifying Pythagorean Triples TOP: 5-7 The Pythagorean Theorem
32. ANS: A REF: 1afd6602-4683-11df-9c7d-001185f0d2ea
OBJ: 5-7.4 Classifying Triangles TOP: 5-7 The Pythagorean Theorem
33. ANS: D REF: 1affa14e-4683-11df-9c7d-001185f0d2ea
TOP: 5-7 The Pythagorean Theorem
34. ANS: A REF: 1b022aba-4683-11df-9c7d-001185f0d2ea
OBJ: 5-8.2 Application TOP: 5-8 Applying Special Right Triangles