Name_____Date_____Per_____

Geometry Chapter 2 Review WS: Geometric Reasoning & Proof

1. Complete each conjecture. You may need to show some "tests" to finish the conjecture.
    a)   The difference of positive and negative number is _____

    b)   If an acute angle is bisected, the resulting angles are each _____

2. Show each conjecture is false by finding a counterexample
    a) Three points on a plane always form a triangle   b) For any real number, x, if $x^2 \geq 1$ then $x \geq 1$

Make a conclusion (if possible) from the following statements in questions 4 & 5:
3. If two angles add to 90°, then they are complementary.

        $m\angle A + m\angle B = 90°.$ _____

4. If the roads are icy, then school will be closed.

        School is closed. _____

5. Identify the hypothesis and conclusion of this conditional statement:
        "If two lines intersect at right angles, then the two lines are perpendicular"
        a) Hypothesis   b) Conclusion

        _____   _____

6. Write the statement, "All triangles have three sides" as a conditional in *if-then* form.

7. Use the conditional statement: "If a point is in the fourth quadrant, then its y-coordinate is negative" to write the forms given below. Then evaluate the truth value of each statement.

    a) Converse: _____
        True / False

    b) Biconditional: _____
        True / False

8. Let p be "you are a student" and let q be "you go to Willamette High School"
a) Choose the statement below that is the **<u>converse</u>**. b) Then decide whether it is true or false.

A. If you go to Willamette High School, then you are a student;
B. If you are a student, then you go to Willamette High School;
C. If you do not go to Willamette High School, then you are not a student;
D. If you are not a student, then you do not go to Willamette High School;

9. Decide if the statement below & its converse are true. If both are true, write a biconditional statement.

              If two lines never intersect, then they are parallel.

Converse: T or F

Biconditional: _____

Tell whether each conclusion uses inductive or deductive reasoning.

10. A sign in the cafeteria says that a car wash is being held on the last Saturday of May. Tomorrow is the last Saturday of May, so Justin concludes that the car wash is tomorrow.

11. So far, at the beginning of every Latin class, the teacher has had students review vocabulary. Latin class is about to start, and Jamilla assumes that they will first review vocabulary.

11. Use the given property to complete each statement

    a) Symmetric Property of Congruence: "If $\angle ABC \cong \angle XYZ$, then $\angle XYZ \cong$ _____"

    b) Addition Property of Equality: "If $AB - CD = EF - CD$, then _____"

    c) Substitution property of equality: "If $a = 2x + 7$, and $x = 3$, then _____"

12. Name the Property of Congruence demonstrated by: If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$.

    A. Reflexive Property   B. Symmetric Property   C. Transitive Property   D. none of these

13. Solve the equation. Justify each step.

        4x + 3 = -13   _____Given_____

                                        _____

                                        _____

14. Write a justification for each step as you solve for x.

Diagram at right	_____Given_____
AC = AB + BC	_____
9x − 5 = (3x + 6) + (5x + 2)	_____
9x − 5 = 8x + 8	_____
x − 5 = 8	_____
x = 13	_____
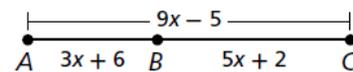
15. Fill in the blanks to complete the two-column proof

Given: ∠HMK and ∠JML are right angles

Prove: ∠HMJ ≅ ∠KML
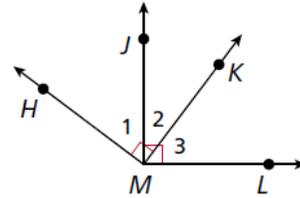
Statements	Reasons
1. ∠HMK and ∠JML are right angles	1.
2. ∠HMK ≅ ∠JML	2.
3. m∠HMK = m∠JML	3.
4. m∠HMJ + m∠JMK = m∠HMK m∠JMK + m∠KML = m∠JML	4.
5. m∠HMJ + m∠JMK = m∠HMK m∠JMK + m∠KML = m∠HMK	5.
6. m∠HMJ + m∠JMK = m∠JMK + m∠KML	6.
7. m∠HMJ = m∠KML	7.
8. ∠HMJ ≅ ∠KML	8.

Options (may use more than once or not at all):
Right Angle Theorem
Def. of Congruent Angles
Given
Angle Addition Postulate (AAP)
Substitution Property
Subtraction Property
Transitive Property

16. Use the statements shown at the right to complete the two-column proof

Given: ∠1 ≅ ∠3

Prove: ∠4 ≅ ∠5
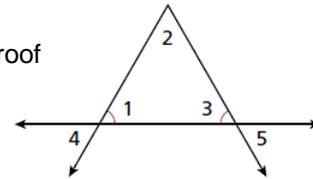
Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Statements (out of order)

∠1≅∠4

∠4≅∠5

∠1≅∠3

∠3≅∠5

∠1≅∠5

17. Provide the reasons for the following proof.

Given: $BC = CD$, $AB = DE$

Prove: $AC = CE$

$A \qquad B \qquad C \qquad D \qquad E$
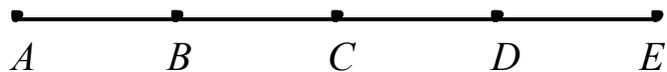
Statements	Reasons
1. $BC = CD$, $AB = DE$	1.
2. $BC + AB = CD + AB$	2.
3. $BC + AB = CD + DE$	3.
4. $BC + AB = AC$, $CD + DE = CE$	4.
5. $AC = CE$	5.

18. Write a two column proof (you may not need all the lines):

Given: m∠2 + m∠3 + m∠4 = 180°

Prove: m∠1 = m∠3 + m∠4
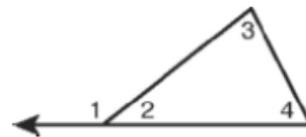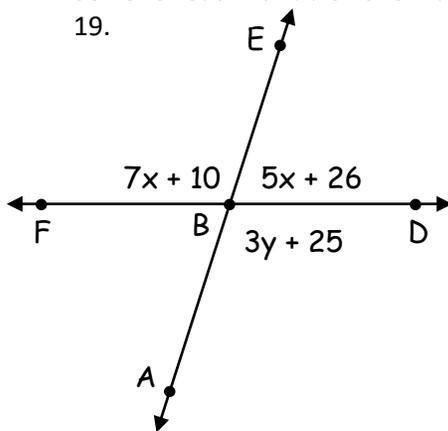
Statements	Reasons
1. m∠2 + m∠3 + m∠4 = 180°	1.
2. ∠1 and ∠2 are a linear pair	2. Definition of linear pair

Solve for each variable. Show all your work.

19.

$7x + 10$ $5x + 26$

$3y + 25$

20.

$12x + 7$ $6y - 25$

$3y + 14$ $13x - 3$