Name Answers Date

Mr.D

Chapter 2 Review

1) Write the if-then form, converse, inverse, and the contrapositive of the statement "An angle whose measure is 34° is an acute angle." After each statement, write each one using symbols and variables p and q.

If-then - If an angle measures 34°, then it is an acute angle $p \to q$

Converse - If an angle is acute, then it measures 34° $q \to p$

Inverse - If an angle does not measure 34°, then it is not an acute angle $\sim p \to \sim q$

Contrapositive - If an angle is not acute, then it does not measure 34° $\sim q \to \sim p$

2) Is this a valid definition? Explain why or why not.
"If the sum of the measures of two angles is 90°, then the angles are complementary."

Yes. the original and converse are true.

3) Write the definition of an equiangular polygon as a single biconditional statement.

A polygon is equiangular if and only if all the angles are congruent.

4) List the three steps of inductive reasoning:

a. Observe

b. Find a pattern

c. Make a conjecture

5) What is a conjecture that can be proven?

A theorem

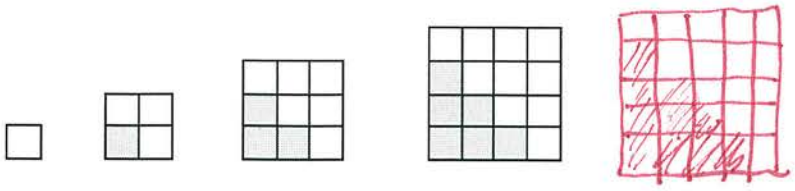
For #6-8, describe the pattern and find the next two terms of the sequence.

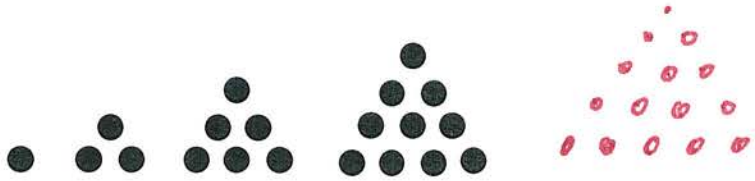
6) ~~-1~~, 2, 5, 14, 41, 122, 365, 1094
1 3 9 27 81 243 729

7) 7, 21, 35, 49, 63, 77, 91, 105
1·7 3·7 5·7 7·7 9·7 11·7 13·7 15·7

8) Z, 1, Y, 2, X, 4, W, 8, V, 16

Draw the next shape in each pattern.

9) 

10) 

11) Find a counterexample to disprove the conjecture: "If the quotient of two numbers is positive, then the two numbers must be positive."

$-3 \div -3 = 1$

In #12 -#14, determine the logical conclusion and state which law you used: Law of Detachment (LOD), Law of Contrapositive (LOC), or Law of Syllogism (LOS). If no conclusion can be drawn, write "no conclusion."

12) If an angle is a right angle, then the angle measures 90°, $\angle B$ is a right angle.

Then $\angle B$ measure 90° LOD

13) If $x = 3$, then $2x = 6$
If $4x = 3$, then $x = 3$

If $4x = 3$, then $2x = 6$ LOS

q p ~p

14) I will eat pancakes, if I get hungry. I am not hungry right now.

No conclusion since this doesn't follow LOC.

15) Complete the following truth table

p	q	$\sim p$	$\sim q$	$\sim p \vee \sim q$
T	T	F	F	F
T	F	F	T	T
F	T	T	F	T
F	F	T	T	T

For #16-19, justify each statement with a property from algebra or property of congruence.

16) If $m\angle A + m\angle B + m\angle C = 180$ AND $m\angle C = 50$, then $m\angle A + m\angle B + 50 = 180$.

Substitution Property

17) If $m\angle A + m\angle B + 50 = 180$, then $m\angle A + m\angle B = 130$.

Subtraction Prop of Equality

18) If $6x = 18$, then $x = 3$.

Division Prop. of Equality

19) If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$

Transitive Property of Congruence

20) Solve the equation. Write a reason for each step.

$-5(x-4)^2 + 8x - 6(x+7) = -5x(x-8) + 34$

$-5(x^2 - 8x + 16) + 8x - 6x - 42 = -5x^2 + 40x + 34$ Dist. Prop.

$-5x^2 + 40x - 80 + 8x - 6x - 42 = -5x^2 + 40x + 34$ Dist. Prop

$-5x^2 + 42x - 122 = -5x^2 + 40x + 34$ Simplify

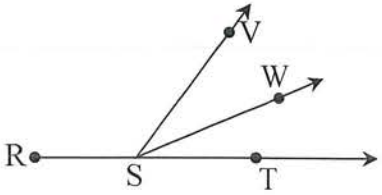
$42x - 122 = 40x + 34$ Add. Prop of =

$2x - 122 = 34$ Sub. Prop of =

$2x = 156$ Add. Prop of =

$x = 78$ Div. Prop of =

For #21 & 22, with the help of the diagram, name the definition, postulate, or theorem that justifies the statement.



21) If $\overline{RS} \cong \overline{ST}$, then S is the midpoint of $\overline{RT}$.

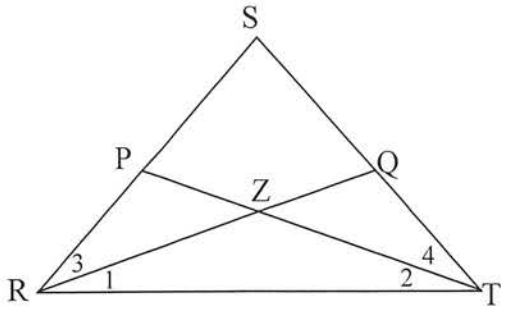
Def. of Midpoint

22) If $\overline{SW}$ bisects $\angle VST$, $\angle VSW \cong \angle WST$

Def of Angle Bisector

23) Given: $m\angle 1 = m\angle 2$; $m\angle 3 = m\angle 4$

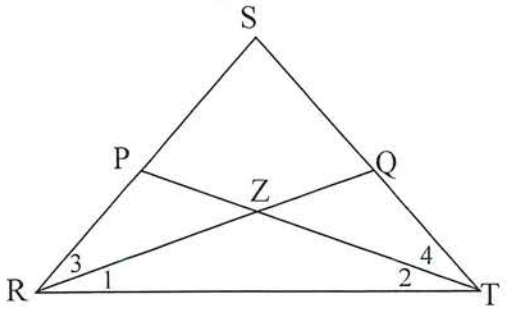
Prove: $m\angle SRT = m\angle STR$



Statement	Reasons
1. $m\angle 1 = m\angle 2$	Given
2. $m\angle 3 = m\angle 4$	Given
3. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$	Addition Prop. of =
4. $m\angle 1 + m\angle 3 = m\angle SRT$ $m\angle 2 + m\angle 4 = m\angle STR$	Angle Add. Post.
5. $\therefore m\angle SRT = m\angle STR$	Substitution Prop.

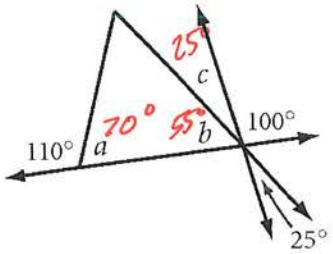
24) Given: $RP = TQ$; $PS = QS$

Prove: $RS = TS$

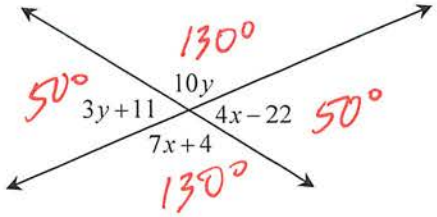


Statement	Reasons
1. $RP = TQ$; $PS = QS$	Given
2. $RP +$ PS $= TQ +$ QS	Add. Prop of =
3. $RS =$ RP + PS ; $TS =$ TQ + QS	Segment Add. Post
4. RS = TS	Substitution Prop.

25) Find all the missing angles.



26) Find the measure of each angle in the diagram.



$(7x+4) + (4x - 22) = 180$

$11x - 18 = 180$

$11x = 198$

$x = 18$

Terms and Symbols to Know

$\rightarrow$	if-then
$\wedge$	and
$\therefore$	therefore
$\sim$	not
$\vee$	or

- Inductive Reasoning
- Conjecture
- Counterexample
- Conditional Statement
- Hypothesis
- Conclusion
- Converse
- Inverse
- Contrapositive
- Biconditional Statement
- Deductive Reasoning
- Law of Detachment
- Law of Contrapositive
- Law of Syllogism
- Congruent Complements Theorem
- Congruent Supplements Theorem
- Linear Pair Postulate
- Vertical Angles Theorem
- Reflexive Property of Equality
- Symmetric Property of Equality
- Transitive Property of Equality
- Substitution Property of Equality
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Distributive Property
- Reflexive Property of Congruence
- Symmetric Property of Congruence
- Transitive Property of Congruence

Bonus:

Draw the following isometrically and orthographically: