Name: ___Key___                                    Date: _____

## 2.3 – 2.8 Review

### 2.3 – Conditional Statements

**For #1-3, identify the hypothesis and conclusion of each conditional statement.**

1) If $4x - 6 = 10$, then $x = 4$.
   [h]              [c]

2) An angle with a measure more than 90 is an obtuse angle.
   [h]                                    [c]

3) Laura is waiting to board an airplane. Over the speakers she hears a flight attendant say, "If you are seated in rows 10 to 20, you may now board." What are the inverse, converse, and the contrapositive of this statement?

   <u>Converse</u>: If you may now board then you are seated in rows 10 to 20

   <u>Inverse</u>: If you are not seat in rows 10 to 20, then you may not board

   <u>Contrapositive</u>: If you may not board, then you are not seated in rows 10 to 20.

### 2.5 – Postulates

**For # 4-6, determine whether each statement is always, sometimes, or never true.**

4) Three collinear points determine a plane.

   Never.

5) Two points A and B determine a line.

   Always

6) A plane contains at least three lines.

   Sometimes

## 2.6 – Algebraic Proofs

**Know the following properties:**
- Addition Property
- Subtraction Property
- Multiplication Property
- Division Property
- Reflexive Property
- Symmetric Property
- Transitive Property
- Distributive Property
- Substitution Property

**For #'s 7-16, identify the property.**

7) If $a = b$, then $a - c = b - c$.  *subtraction*

8) If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.  *division*

9) If $a = b$ and $b = a$.  *Symmetric*

10) If $a = b$, then $a$ may be replaced by $b$ in any equation or expression.  *substitution*

11) If A, B, and C are collinear, then point B is between A and C if and only if $AB + BC = AC$.  *segment Add Post*

12) If $a = b$, then $a + c = b + c$.  *Addition*

13) If $a = b$, then $a \cdot c = b \cdot c$.  *Multiplication*

14) $a = a$  *Reflexive*

15) If $a = b$ and $b = c$, then $a = c$.  *Transitive*

16) $a(b + c) = ab + ac$.  *Distributiven*

17) Write a two-column proof for the following conjecture.

Given: $\frac{12x-8}{4} = 4$
Prove: $x = 2$

| S | B |
|---|---|
| ① $\frac{12x-8}{4} = 4$ | ① Given |
| ② $12x - 8 = 16$ | ② Multiplication |
| ③ $12x = 24$ | ③ Addition |
| ④ $x = 2$ | ④ division |

## 2.7 – Proving Segment Relationships

- Know the Segment Addition Postulate and how to solve proofs using this postulate.

## 2.8 – Proving Angle Relationships

- Know the Angle Addition Postulate
- Know the Supplement Theorem
- Know the Complement Theorem
- Know the Congruent Supplements Theorem
- Know the Congruent Complements Theorem
- Know the Vertical Angles Theorem
- Know the Right Angles Theorem

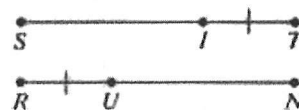### Sample Proof Questions for Sections 2.7 and 2.8

Complete the following proofs.

18) Given: $m\angle1 = m\angle3$ ; $m\angle2 = m\angle4$.
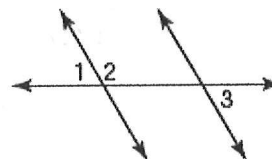   Prove: $m\angle ABC = m\angle DEF$
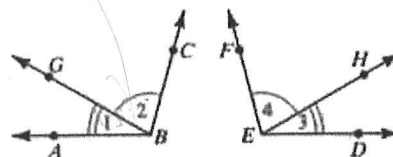
19) Given: $ST = RN$ ; $IT = RU$.
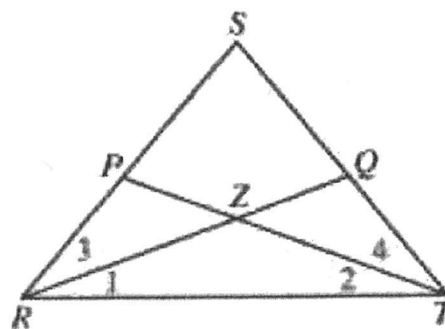   Prove: $SI = UN$

   *Answer on back*

20) Given: $\angle1$ and $\angle2$ form a linear pair.
   $\angle2$ and $\angle3$ are supplementary.
   Prove: $\angle1 \cong \angle3$

**For #21-24, refer to the diagram on the right.**

21) Given: $m\angle1 = m\angle2$ ; $m\angle3 = m\angle4$.
   Prove: $m\angle SRT = m\angle STR$

22) Given: $RP = TQ$ , $PS = QS$.
   Prove: $RS = TS$

23) Given: $RQ = TP$ , $ZQ = ZP$
   Prove: $RZ = TZ$

24) Given: $m\angle SRT = m\angle STR$ ; $m\angle3 = m\angle4$
   Prove: $m\angle1 = m\angle2$

---

Handwritten work:

18) S      R

① $m\angle1 = m\angle3$    ① Given
   $m\angle2 = m\angle4$

② $\angle1 + \angle3 = \angle3 + \angle4$    ② Addition

③ $\angle1 + \angle2 = \angle ABC$    ③ $\angle$ Add. Post
   $\angle3 + \angle4 = \angle DEF$

④ $m\angle ABC = m\angle DEF$    ④ Subs

**(19)**

| S | R |
|---|---|
| ① ST = RN | ① Given |
| ② ST = SI + IT<br>RN = RU + UN | ② Seg. Add Post |
| ③ SI + IT = RU + UN | ③ Subs |
| ④ IT = RU | ④ Given |
| ⑤ SI = UN | ⑤ Subtraction |

**(20)**

| S | R |
|---|---|
| ① ∠1 and ∠2 form a lin. pair<br>∠2 and ∠3 are suppl. | ① Given |
| ② ∠1 and ∠2 are suppl. | ② linear pairs are suppl. |
| ③ ∠1 ≅ ∠3 | ③ ∠'s suppl. to same or ≅ ∠'s are ≅. |

**(21)**

| S | R |
|---|---|
| ① m∠1 = m∠2 ; m∠3 = m∠4 | ① Given |
| ② ∠1 + ∠3 = ∠2 + ∠4 | ② Addition |
| ③ ∠1 + ∠3 = ∠SRT<br>∠2 + ∠4 = ∠STR | ③ ∠ Add Post |
| ④ m∠SRT = m∠STR | ④ Subs |

**(22)**

| S | R |
|---|---|
| ① RP = TQ ; PS = QS | ① Given |
| ② RP + PS = TQ + QS | ② Addition |
| ③ RP + PS = RS<br>TQ + QS = TS | ③ Seg. Add. Post. |
| ④ RS = TS | ④ Subs |

**(23)**

| S | R |
|---|---|
| ① RQ = TP | ① Given |
| ② RQ = RZ + ZQ<br>TP = TZ + ZP | ② Seg. Add Post |
| ③ RZ + ZQ = TZ + ZP | ③ Subs |
| ④ ZQ = ZP | ④ Given |
| ⑤ RZ = TZ | ⑤ Subtraction |

**(24)**

| S | R |
|---|---|
| ① m∠SRT = m∠STR | ① Given |
| ② m∠SRT = ∠1 + ∠3<br>m∠STR = ∠2 + ∠4 | ② ∠ Add. Post |
| ③ ∠1 + ∠3 = ∠2 + ∠4 | ③ Subs |
| ④ m∠3 = m∠4 | ④ Given |
| ⑤ m∠1 = m∠2 | ⑤ Subtraction |