Name: _____ Date: _____ Row: _____ Period: _____

Assignment #: _____

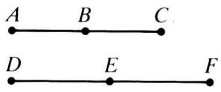
# INEQUALITIES

**Using the properties of inequality, classify each conditional as true or false.**

1. If $3x + 2 = 8$, then $8 > 3x$.
2. If $a < b$ and $c < b$, then $a < c$.
3. If $4y < 16$, then $y < 4$.
4. If $3x > 48$, then $3x + 4 > 50$.
5. If $c < d$, then $c - 9 > d - 9$.
6. If $\frac{1}{2}y > 7$, then $y > 14$.

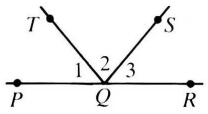
**Some information about the diagram is given. Tell whether the other statements can be deduced from what is given. (Write *yes* or *no*.)**

7. Given: $B$ is the midpoint of $\overline{AC}$;
$E$ is the midpoint of $\overline{DF}$;
$DF > AC$



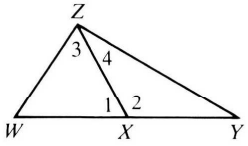

   a. $DF > DE$
   b. $AB + BC = AC$
   c. $AB < BC$
   d. $DE > AC$
   e. $EF = \frac{1}{2}DF$
   f. $DE > AB$

8. Given: Point $T$ lies in the interior of $\angle PQS$;
point $S$ lies in the interior of $\angle TQR$.




   a. $m\angle PQS > m\angle 2$
   b. $m\angle 1 = m\angle 2$
   c. $m\angle PQS = m\angle TQR$
   d. $m\angle 1 > m\angle 3$
   e. $m\angle 1 + m\angle 2 + m\angle 3 = 180$

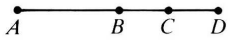
9. Given: $\triangle WYZ$; $\triangle WXZ$




   a. $WY > WX$
   b. $WZ = WX$
   c. $WX = XY$
   d. $m\angle WZY = m\angle 3 + m\angle 4$
   e. $m\angle 2 > m\angle 3$
   f. $m\angle 3 > m\angle 4$

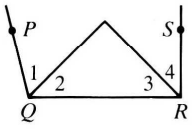
**In Exercises 10 and 11, complete the proofs.**

10. Given: $AB > CD$
Prove: $AC > BD$




| Statements | Reasons |
|---|---|
| 1. _____ | 1. _____ |
| 2. $BC = BC$ | 2. _____ |
| 3. $AB + BC > BC + CD$ | 3. _____ |
| 4. $AB + BC = AC$; $BC + CD = BD$ | 4. _____ |
| 5. _____ | 5. _____ |

11. Given: $m\angle PQR > m\angle SRQ$;
$m\angle 2 = m\angle 3$
Prove: $m\angle 1 > m\angle 4$




| Statements | Reasons |
|---|---|
| 1. _____ | 1. _____ |
| 2. $m\angle PQR = m\angle$____ $+ m\angle$____<br>$m\angle SRQ = m\angle$____ $+ m\angle$____ | 2. _____ |
| 3. $m\angle 1 + m\angle 2 > m\angle 3 + m\angle 4$ | 3. _____ |
| 4. _____ | 4. _____ |

12. Given: $XW = XY$
Prove: $m\angle XWZ > m\angle 1$