Name:_____ Date:_____

Geometry: Worksheet 1.3 Notes

1. ***Defn:*** **Collinear -** points that lie on the same line (or path)

2. ***Defn:*** **Betweenness -** When 3 or more points occupy the same line, one point is "between" the other two.

3. ***Defn:*** **Triangle Inequality -** The third side of any triangle is always greater than the difference & less than the sum of the other two sides. (See next page #15-17)

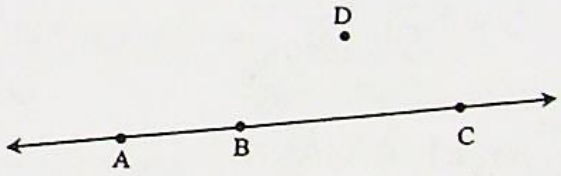
TB P. 19 ★ TABLE

ASSUMPTIONS FROM DIAGRAMS

You Should Assume	You Should NOT Assume
Straight lines ✓	Right angles ⊘
Straight angles ✓	Congruent segments ⊘
Collinearity of points ✓	Congruent angles ⊘
Betweenness of points ✓	Relative sizes of segments or angles ⊘
Relative Position of points ✓	

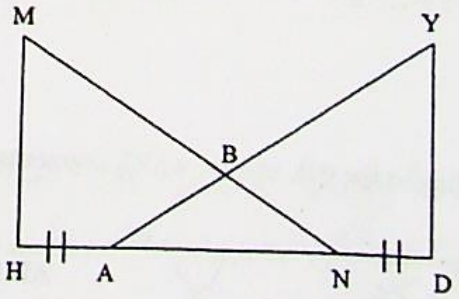
Checking for Understanding.

1. *True or false*: A, B, and C are collinear.
2. *True or false*: A, B, and D are collinear.
3. *True or false*: D and C are collinear.
4. *True or false*: B is between A and C.
5. *True or false*: D is between B and C.



Use to answer questions 1-5.

6. *Always, sometimes, never*: ∠H is a right angle. don't Assume!
7. *Always, sometimes, never*: ∠M ≅ ∠Y don't Assume!
8. *Always, sometimes, never*: $\overline{HA} \cong \overline{ND}$ tickmarks!
9. *True or false*: ∠HAN is a straight angle may assume!
10. *True or false*: A, N and D are collinear. may assume!
11. *True or false*: B is between A and N. may assume! (not collinear)



Use to answer questions 6-11.

Use the triangle inequality to answer questions 12-17.

12. *Yes or no*: Can a triangle have sides of length 1, 2, and 3?

13. *Yes or no*: Can a triangle have sides of length 3, 4, and 5?

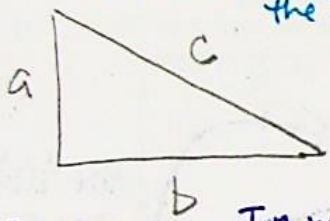
14. *Yes or no*: Can a triangle have sides of length 6, 6, and 15?

15. If 2 sides of a triangle have lengths of 4 and 13, then the third side must be **longer** than 9 and **shorter** than 17.

16. If 2 sides of a triangle have lengths of 15 and 22, then the third side must be **longer** than 7 and **shorter** than 37.

17. If 2 sides of a triangle have lengths of 6.37 and 9.84, then the third side must be **longer** than 3.47 and **shorter** than 16.21.

* Notice: The third side is always greater than the difference and less than the sum of the other two sides!



(12) $1+2 \not> 3$? No!

(13) $3+4>5$ $7>5$ ✓
$4+5>3$ $9>3$ ✓
$3+5>4$ $8>4$ ✓

(14) $6+6>15$ $12 \not> 15$

* (15) Let x = 3rd side
$4+13>x$ $17>x$ $x<17$
$4+x>13$ $x>9$ $x>9$
$x+13>4$ ~~$x>-9$~~

* (16) $15+22>x$ $x<37$
$15+x>22$ $x>7$
$22+x>15$ ~~$x>-7$~~

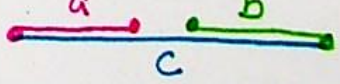
* (17): $6.37+9.84>x$ $x<16.21$
$6.37+x>9.84$ $x>3.47$
$9.84+x>6.37$ ~~$x>-3.47$~~

Postulate: Pg. 691

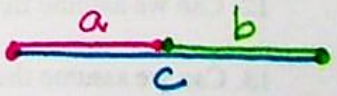
In words... The sum of the measures of any two sides of a triangle is always greater than the measure of the third side

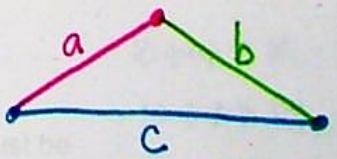
In symbols...
$a+b>c$
$b+c>a$
$a+c>b$

$a+b<c$



$a+b=c$





$a+b>c$

and so on...