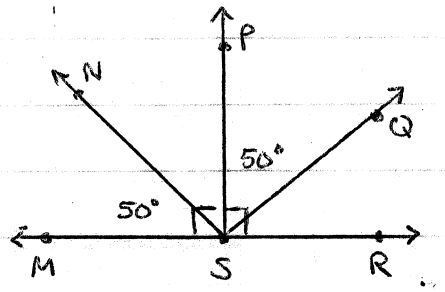
Geometry, Ch 2-7, Exer., pg 119, #1-6, 8-15, 17-29

1. If two lines intersect at a point, then the <u>vertical</u> angles formed by the intersecting lines are congruent.

2. Describe the relationship of angle measures for
   - complement angles: sum to 90°
   - supplementary angles: sum to 180°
   - vertical angles: congruent
   - linear pairs: sum to 180°

Identify all pairs of congruent angles.

3. 

$\angle MSP$ and $\angle RSP$ are a linear pair. Since the sum of a linear pair is equal to 180°, and $\angle RSP = 90°$, $\angle MSP$ must also equal 90°.

Using Angle Addn: $\angle RSQ + 50° = 90°$ $\quad$ $50° + \angle NSP = 90°$

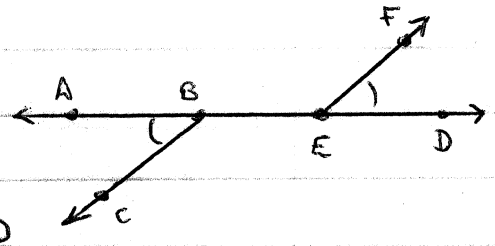
$\angle RSQ = 40°$ $\quad$ $\angle NSP = 40°$

Congruent Angles:
1. $\angle MSP \cong \angle RSP$ (= 90°)
2. $\angle MSN \cong \angle QSP$ (= 50°)
3. $\angle RSQ \cong \angle NSP$ (= 40°)

Is $\angle MSQ \cong \angle RSN$?

4. $\angle ABC$ is supplementary to $\angle CBD$

$\angle CBD$ is supplementary to $\angle DEF$



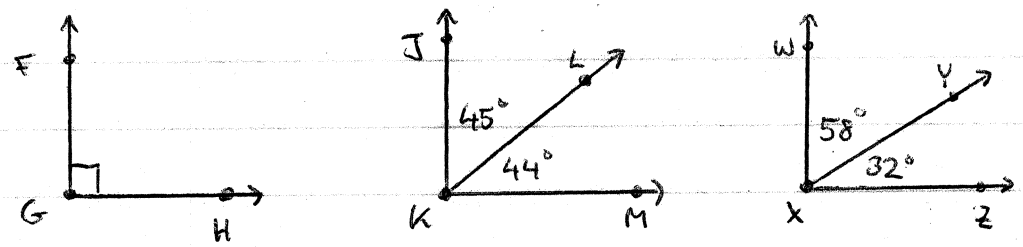
$\angle ABC + \angle CBD = 180$ $\qquad$ $\angle CBD + \angle DEF = 180$

$\angle ABC = 180 - \angle CBD$ $\qquad$ $\angle DEF = 180 - \angle CBD$

① $\angle ABC \cong \angle DEF$

② $\angle AEF \cong \angle DBC$ $\qquad$ Congruent Supplements Thm.

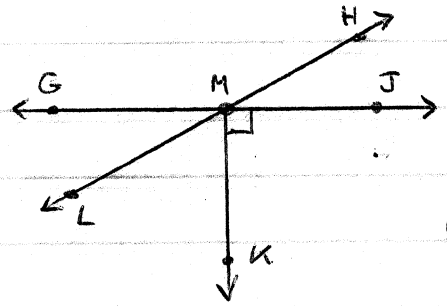
5.



$\angle JKM = 89°$ $\qquad$ $\angle WXZ = 90°$

The only pair of congruent angles ~~are~~ is $\angle FGH \cong \angle WXZ$

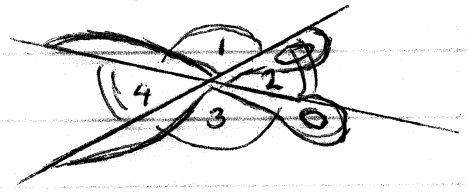
6.



① $\angle GML \cong \angle JMH$, Vertical Angles

② $\angle GMH \cong \angle JML$, Vertical Angles

③ $\angle JMK \cong \angle GMK$, Right Angles



For #8-11, Use diagram.

8. If $m\angle 1 = 155°$, $m\angle 2 =$ 25° $\quad m\angle 3 =$ 155° $\quad m\angle 4 =$ 25°

9. If $m\angle 3 = 168°$, $m\angle 1 =$ 168° $\quad m\angle 2 =$ 12° $\quad m\angle 4 =$ 12°

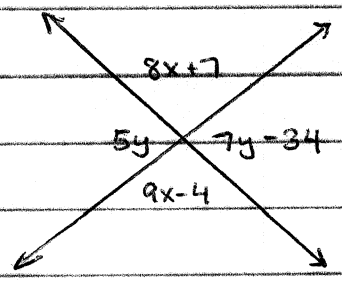
10. If $m\angle 4 = 27°$, $m\angle 1 =$ 153° $\quad m\angle 2 =$ 27° $\quad m\angle 3 =$ 153°

11. If $m\angle 2 = 32$, $m\angle 1 =$ 148° $\quad m\angle 3 =$ 148° $\quad m\angle 4 =$ 32°

ALGEBRA Find the values of x and y

[Vertical Angles are $\cong$]

12.



$8x+7 = 9x-4$

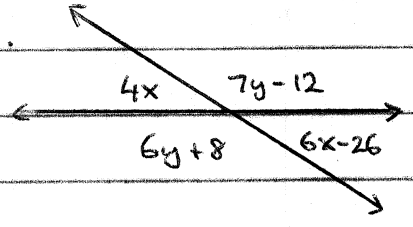
$11 = x$

$5y = 7y-34$

$34 = 2y$

$17 = y$

13.



$4x = 6x-26$

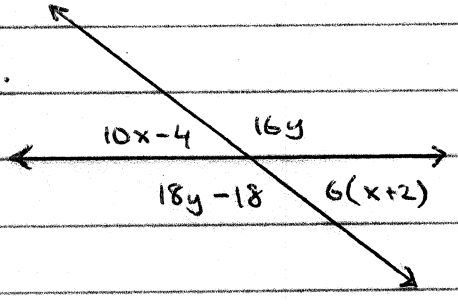
$26 = 2x$

$13 = x$

$7y-12 = 6y+8$

$y = 20$

14.



$10x-4 = 6(x+2)$

$10x-4 = 6x+12$

$4x = 16$

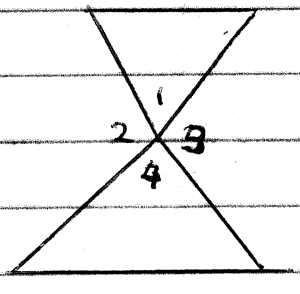
$x = 4$

$18y-18 = 16y$

$2y = 18$

$y = 9$

15. Describe the error in stating $\angle 1 \cong \angle 4$ and $\angle 2 \cong \angle 3$.

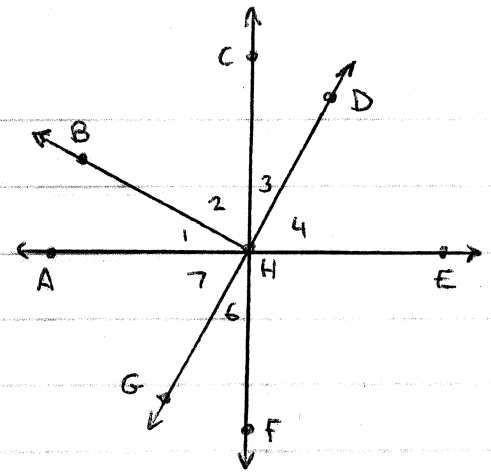


THIS IS A TERRIBLE QUESTION!!

It looks as if $\angle 1 \cong \angle 4$ and $\angle 2 \cong \angle 3$ because they are Vertical Angles. Throughout this book what looks like a line most often is a line. Ask for class discussion

Answer #17-21 using diagram,

and $m\angle FHE = m\angle BHG = m\angle AHF = 90^\circ$



17. If $m\angle 3 = 30^\circ$,

then $m\angle 6 =$ $\underline{30^\circ}$. Vertical Angles

18. If $m\angle BHF = 115^\circ$, then $m\angle 3 =$ $\underline{25^\circ}$

$\angle BHF = \angle BHG + \angle 6$

$115^\circ = 90^\circ + \angle 6$

$25^\circ = \angle 6$ $\angle 3$ is Vertical to $\angle 6$; $\therefore \angle 3 = 25^\circ$

19. If $m\angle 6 = 27^\circ$,

then $m\angle 1 =$ $\underline{27^\circ}$

$\angle AHF = \angle 7 + \angle 6$

$90^\circ = \angle 7 + 27^\circ$

$63^\circ = \angle 7$

$\angle BGH = \angle 1 + \angle 7$

$90^\circ = \angle 1 + 63^\circ$

$27^\circ = \angle 1$

20. If $m\angle DHF = 133^\circ$,

then $m\angle GHG =$ $\underline{133^\circ}$

$\angle DHF = \angle 4 + \angle FHE$

$133^\circ = \angle 4 + 90^\circ$

$43^\circ = \angle 4$

$43^\circ = \angle 7$, Vertical

$\angle CHG = \angle CHA + \angle 7$

$\angle GHG = 90^\circ + 43^\circ$

$\angle CHG = 133^\circ$

21. If $m\angle 3 = 32^\circ$,

then $m\angle 2 =$ $\underline{58^\circ}$.

$\angle 3 \cong \angle 6$, Vertical

since $\angle 3 = 32^\circ$,

$\angle 6 = 32^\circ$

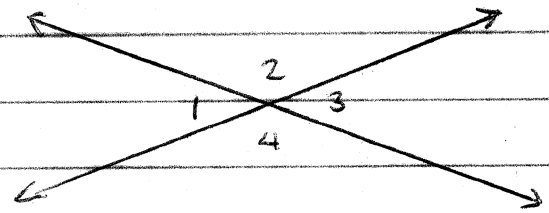
$\angle 2 + \angle BHG + \angle 6 = 180^\circ$

$\angle 2 + 90^\circ + 32^\circ = 180^\circ$

$\angle 2 + 122^\circ = 180^\circ$

$\angle 2 = 58^\circ$

Two lines that are not perpendicular intersect such that $\angle 1$ and $\angle 2$ are a linear pair, $\angle 1$ and $\angle 4$ are a linear pair, and $\angle 1$ and $\angle 3$ are vertical angles. Tell whether each statement is TRUE or FALSE.



22. $\angle 1 \cong \angle 2$ FALSE

23. $\angle 1 \cong \angle 3$ TRUE

24. $\angle 1 \cong \angle 4$ FALSE

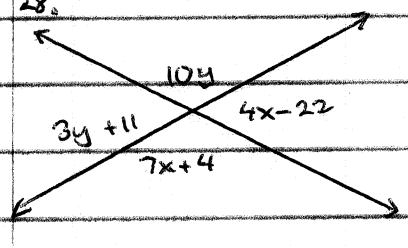
25. $\angle 3 \cong \angle 2$ FALSE

26. $\angle 2 \cong \angle 4$ TRUE

27. $m\angle 3 + m\angle 4 = 180$ TRUE

<u>ALGEBRA</u> Find the measure of each angle in the diagram.

28.



[Linear Pairs sum to 180°]

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

$11x-18=180$

$11x = 198$

$\boxed{x = 18}$

1st Angle: $4(18)-22$

$72-22=50$

2nd Angle: $7(18)+4$

$126+4=130$

Since the other angles are vertical to existing ones, do we even need to solve for y??

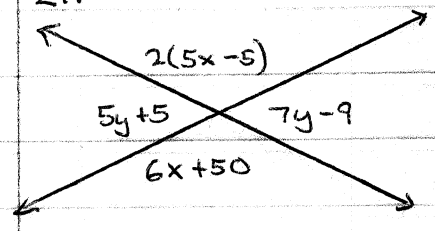
$(3y+11)+(10y)=180$

$13y+11=180$

$13y=169$

$y=13$

29.



[Vertical angles are $\cong$]

$2(5x-5) = 6x+50$

$10x - 10 = 6x + 50$

$4x = 60$

$\boxed{x = 15}$ → 1st Angle: $2(5(15)-5)$

$2(75-5)$

$2(70) = 140$

2nd Angle: $6(15)+50$

$90 + 50 = 140$

☆ Because they're linear pairs, wouldn't the remaining angles each have to be 40°??

$5y + 5 = 7y - 9$

$14 = 2y$

$\boxed{7 = y}$ → 3rd Angle: $5(7)+5$

$35 + 5 = 40$

4th Angle: $7(7)-9$

$49 - 9 = 40$

Thought so!