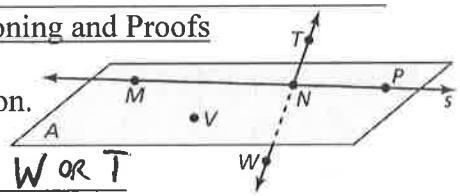
KEY

Geometry Fall Semester Review: Chapters 1 & 2 Name: _____

Show all work for full credit. PS1 – Basics of Geometry & PS2 – Reasoning and Proofs



1. Use the diagram to name the following. Be sure to use proper notation.

a) three collinear points: M, N, P

b) another name for plane A: MVP

c) a pair of opposite rays: $\overrightarrow{NM}$ & $\overrightarrow{NP}$

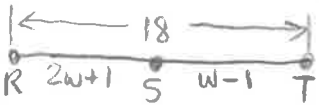
d) a point not on plane A: W OR T

e) three other names for line MP: S, $\overleftrightarrow{MN}$, $\overleftrightarrow{NP}$

f) three non-collinear points: M T V

2. R, S, and T are collinear. S is between R and T. $RS = 2w + 1$, $ST = w - 1$, and $RT = 18$.

a) Use the Segment Addition Postulate to solve for w. $2w+1 + w-1 = 18$



$3w = 18$

$3 \quad 3$

$w = 6$

b) Then determine the length of $\overline{RS}$.

$RS = 2(6)+1$

$12 + 1$

$RS = 13$

$ST = 6 - 1$

$= 5$

$13 + 5 = 18$ ✓

3. Use the points $A(-3, -8)$ and $B(-2, -5)$ to find the following between these points:

a) slope $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5+(+8)}{-2-(-3)}$

$= \frac{3}{1} =$ 3

b) midpoint $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\left(\frac{-3+(-2)}{2}, \frac{-8+(-5)}{2}\right)$

$(-2.5, -6.5)$

c) distance $d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

$d = \sqrt{(-2+3)^2 + (-5+8)^2}$

$d = \sqrt{1^2 + 3^2} = \sqrt{1+9} = \sqrt{10} \approx 3.16$

4. Find the coordinates of the other endpoint of a segment with one endpoint X(4, -6) and the midpoint M(1, 5).
(NOT NEEDED FOR CONCEPTS OF GEOMETRY)

x: $1 = \frac{x+4}{2}$

$2 = x + 4$

$-2 = x$

y: $5 = \frac{y+(-6)}{2}$

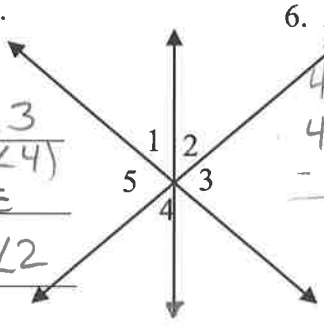
$10 = y - 6$

$16 = y$

$(-2, 16)$

5. Refer to the figure to the right.

Name a pair of:



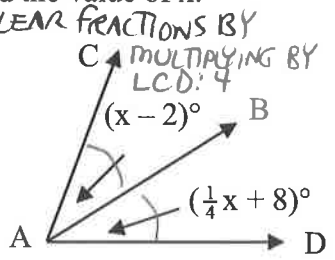
a) Vertical angles $\angle 5$ & $\angle 3$ (OR $\angle 2$ & $\angle 4$)

b) Linear pair angles NONE

c) Adjacent angles $\angle 1$ & $\angle 2$

ALSO $\angle 1$ & $\angle 5$, $\angle 2$ & $\angle 3$, $\angle 4$ & $\angle 5$

6. $\overrightarrow{AB}$ bisects $m\angle CAD$. Find the value of x.



CLEAR FRACTIONS BY MULTIPLYING BY LCD: 4

$4\left(x - 2 = \frac{1}{4}x + 8\right)$

$4x - 8 = x + 32$

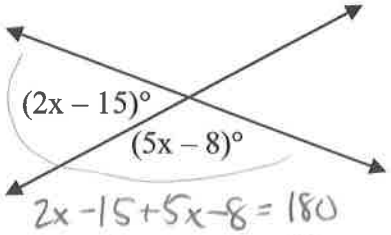
$-x \quad +8 \quad -x \quad +8$

$3x = 40$

$x = \frac{40}{3}$ $13\frac{1}{3}$ 13.33

7. Refer to the following diagrams. Find the value of x and y.

a)



LINEAR PAIR = 180°

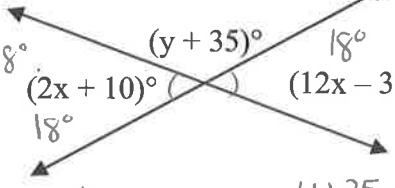
$2x - 15 + 5x - 8 = 180$

$7x - 23 = 180$

$7x = 203$

$x = 29$

b)



$2(4) + 10 = 18°$

$2x + 10 = 12x - 30$

$-2x \quad +30 \quad -2x \quad +30$

$\frac{40}{10} = \frac{10x}{10}$

$x = 4$

TAT FIRST TO SOLVE FOR x, (12x – 30)° THEN SUBSTITUTE AND SOLVE FOR y.

$y + 35 + 18 = 180$

$y + 53 = 180$

$y = 127$

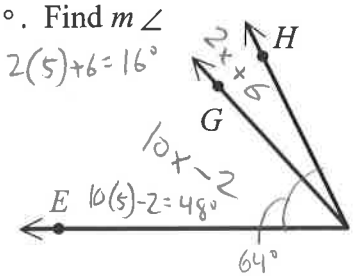
8. $m\angle HFG = (2x+6)°$ and $m\angle EFG = (10x-2)°$ and $m\angle HFE = 64°$. Find $m\angle HFG$ and $m\angle EFG$.

$2x+6+10x-2=64$
$12x+4=64$
$12x=60$
$x=5$

$2(5)+6=16°$
$10(5)-2=48°$

$m\angle HFG = 16°$
$m\angle EFG = 48°$

64 ✓

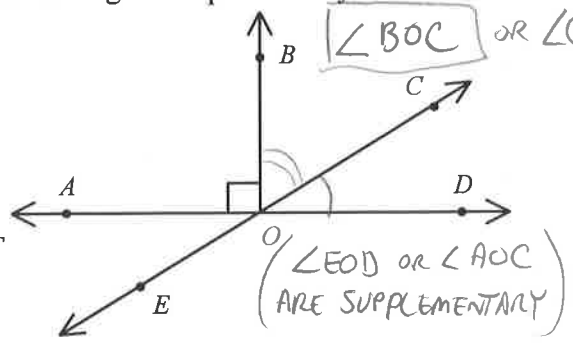


9. Name an angle complementary to $\angle COD$

$+90°$

$\angle BOC$ OR $\angle COB$

$\angle EOD$ OR $\angle AOC$ ARE SUPPLEMENTARY



10. Use the given conditional statement to write the indicated form of that statement.

a) Write the inverse of "If an angle has a measure of 25°, then it is acute."

IF AN ANGLE DOES NOT HAVE A MEASURE OF 25°, THEN IT IS NOT ACUTE.

b) Write the converse of "If Jim lives in Orlando, then he lives in Florida."

IF JIM LIVES IN FLORIDA, THEN HE LIVES IN ORLANDO.

c) Write the contrapositive of "If a polygon is a square, then it has four sides.

IF A POLYGON DOES NOT HAVE FOUR SIDES, THEN IT IS NOT A SQUARE.

11. Use the true conditional statement, "A mile is a length of 5280 feet."

a. Rewrite in if-then form

IF A LENGTH IS A MILE, THEN IT IS 5280 FEET.

b. Box the hypothesis and circle the conclusion in part (a)

c. Write the contrapositive

IF A LENGTH IS NOT 5280 FEET, THEN IT IS NOT A MILE.

d. Write the inverse

IF A LENGTH IS NOT A MILE, THEN IT IS NOT 5280 FEET.

e. Write as a biconditional (if appropriate to do so – otherwise explain why not)

A LENGTH IS A MILE IF AND ONLY IF IT IS 5280 FEET.

YES, BOTH THE ORIGINAL AND CONVERSE STATEMENTS ARE TRUE.

12. Use the given statement: If a polygon has four equal sides, then it is a square.

a. Is the statement True or False?

b. Explain your answer or give a counter example to demonstrate it is false.

A RHOMBUS ALSO HAS FOUR EQUAL SIDES BUT A SQUARE MUST HAVE FOUR RIGHT ANGLES, TOO.

13. Which property of equality describes the following: If $x - 4 = 11$, then $x = 15$?

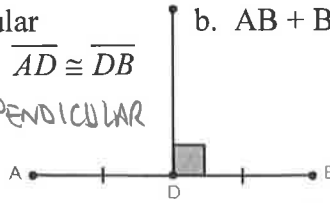
$+4 \quad +4$

ADDITION PROPERTY OF EQUALITY.

14. State the property, theorem, postulate or definition used to make the conclusion:

a. If $\overline{CD}$ is a perpendicular bisector of $\overline{AB}$, then $\overline{AD} \cong \overline{DB}$

DEFINITION of A PERPENDICULAR BISECTOR



b. AB + BC = AC SEGMENT ADDITION POSTULATE

a b b c a c

c. If $2x + 4 = 17$, then $2x = 13$

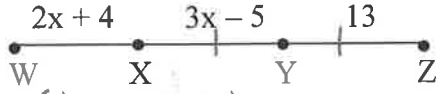
$-4 \quad -4$

SUBTRACTION PROPERTY OF EQUALITY

d. If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$

TRANSITIVE PROPERTY of SEGMENT CONGRUENCE.

15. In the diagram, $\overline{YZ} \cong \overline{XY}$. Find the length of $\overline{WY}$.



$3x - 5 = 13$

$+5 \quad +5$

$3x = 18$

$x = 6$

$2(6)+4 \quad 3(6)-5$

$12+4 \quad 18-15$

$16 \quad 13$

$WY = WX + XY$

$WY = 16 + 13$

$WY = 29$

16. Two angles, $\angle 1$ and $\angle 2$, are supplementary. If $m\angle 1$ is 83°, what is $m\angle 2$?

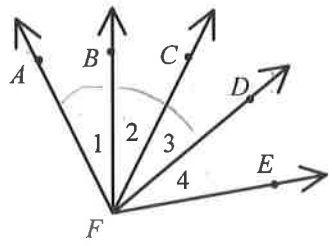
$180 - 83 = 97$

$m\angle 2 = 97°$

17. Provide the reasons for all the statements in the following proof:

Given: $m\angle AFD = m\angle EFB$

Prove: $m\angle 1 = m\angle 4$



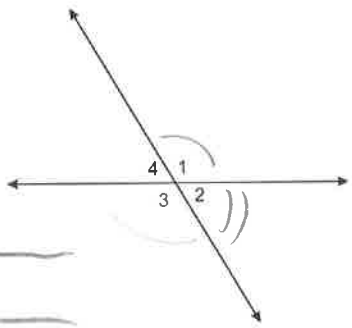
Statements	Reasons
1. $m\angle AFD = m\angle EFB$	1. GIVEN
2. $m\angle AFD - m\angle BFD = m\angle EFB - m\angle BFD$	2. SUBTRACTION P.O.E.
3. $m\angle 1 + m\angle BFD = m\angle AFD$, $m\angle 4 + m\angle BFD = m\angle EFB$	3. ANGLE ADDITION POSTULATE
4. $m\angle 1 = m\angle AFD - m\angle BFD$, $m\angle 4 = m\angle EFB - m\angle BFD$	4.
5. $m\angle 1 = m\angle 4$	5. SUBTRACTION
	6. TRANSITIVE P.O.E (OR DOUBLE SUBSTITUTION)

18. Prove the vertical angles theorem:

Given: $\angle 1$ and $\angle 2$ are a linear pair and

$\angle 2$ and $\angle 3$ are a linear pair

Prove: $m\angle 1 = m\angle 3$



STATEMENTS	REASONS
$\angle 1$ & $\angle 2$ AND $\angle 2$ & $\angle 3$ ARE LINEAR PAIRS	GIVEN
$m\angle 1 + m\angle 2 = 180$, $m\angle 2 + m\angle 3 = 180$	LINEAR PAIR POSTULATE
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	TRANSITIVE PROPERTY
$m\angle 1 = m\angle 3$	SUBTRACTION PROPERTY