Welcome to Pre-AP Geometry
Summer Homework

Congratulations, you have qualified to be enrolled in Pre-AP Geometry. This class is a rigorous 10th-grade level mathematics class.

This class requires summer homework. This summer homework consists of problems covering 6th, 7th, 8th, and Algebra concepts. You are expected to organize your time and complete the questions over the span of your summer vacation, not at the last minute.

The following guidelines will be followed:

1. SHOW ALL work in a neat and organized manner.
2. "Guess and Check" is not considered showing your work.
3. Calculators should NOT be used on this assignment. All answers must be exact.
4. In the first week of class you will have the opportunity to ask questions.
5. The problems will be due the following week.
6. A summer homework assessment will be given within the first two weeks of school.
7. There will be NO EXTENSIONS.

Thank you and happy calculating!

West Ouachita High School Pre-AP Geometry Teacher

Mrs. Maier

Pre-AP Geometry-Summer Math **Name_____Block_____**

The following is a list of terms and definitions that you should know. Match the term on the right with the definition on the left by placing the letter in the blank. None will be used more than once.

1._____Two points and all the points between them that lie on the line containing the two points.

2._____Part of a line with an endpoint that extends endlessly in one direction.

3. Two noncollinear rays with a common endpoint.

4._____The common endpoint of two rays that form an angle.

5._____A segment from the center of a circle to any point on the circle.

6._____An angle whose measure is 90°.

7._____The point that divides a segment into two congruent segments.

8._____Lines that intersect to form right angles.

9._____An angle whose measure is between 0° and 90°.

10._____A ray that divides an angle into two congruent angles.

11._____A chord that is drawn through the center of a circle.

12._____An angle whose measure is between 90° and 180°.

13._____Lines in the same plane that never intersect.

14._____A pair of angles whose sum is 90°.

15._____A polygon with exactly four sides.

16._____A triangle in which all three angles measure less than 90°.

17._____A polygon with exactly ten sides.

18._____A triangle with no congruent sides.

19._____A polygon with exactly eight sides.

20._____A triangle in which one angle measures greater than 90°.

21._____A polygon with exactly five sides.

22._____A pair of angles whose sum is 180°.

23._____A triangle that contains an angle whose measure is equal to 90°.

24___.__A polygon with exactly six sides.

25._____A triangle with at least two congruent sides.

26._____A polygon in which all sides are congruent and all angles are congruent.

A. scalene triangle

B. perpendicular lines

C. line segment

D. obtuse angle

E. quadrilateral

F. acute angle

G. parallel lines

H. octagon

I. obtuse triangle

J. vertex

K. pentagon

L. right angle

M. ray

N. decagon

O. angle bisector

P. regular polygon

Q. right triangle

R. midpoint of a segment

S. isosceles triangle

T. supplementary angles

U. radius of a circle

V. acute triangle

W. diameter of a circle

X. complementary angles

Y. hexagon

Z. angle

PreAP Geometry-Summer Math **Name**_____ **Block**_____

General instructions: **All work must be neat and readable to receive credit.**
"Guess and check" is not considered showing your work!
Formulas can be found at *www.tea.state.tx.us*.
All answers must be exact. ie : $\frac{15}{7}$, 12π, $3\sqrt{5}$

Solve each of the following problems in the space provided.

1. $5x + 7x = 9x - 40$

2. $\frac{1}{2}x + \frac{2}{3}x = 28$

3. $5(3 + x) = 75$

4. $(4x + 7) - (12 - 9x) = 86$

5. $\frac{18-6x}{12} = 9 + 2x$

6. $\frac{2x}{16} = \frac{50}{40}$

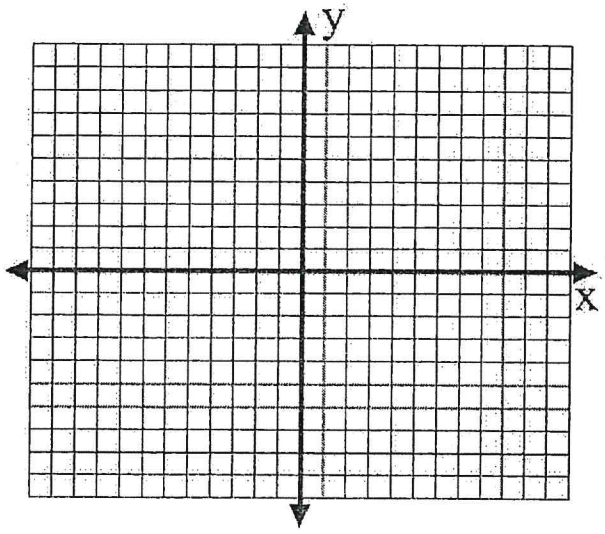
7. $\frac{x}{16} = \frac{4}{x}$

8. $\frac{5x + 6}{10} = \frac{4x - 8}{6}$

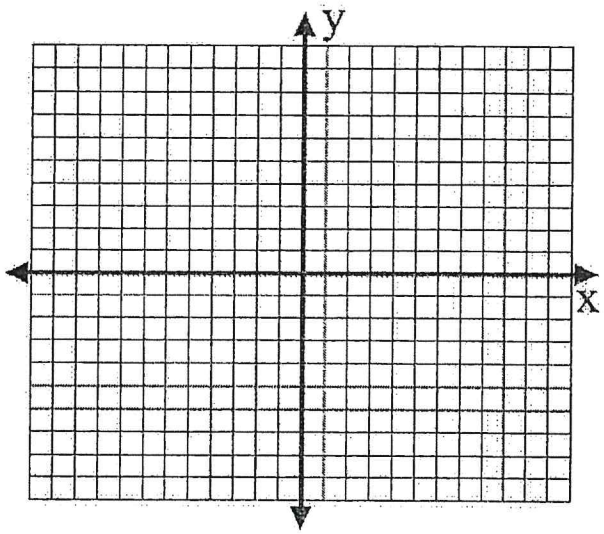
9. $\frac{x - 4}{x + 6} = \frac{x - 8}{x - 3}$

Solve each system of equations by substitution or elimination. Verify your solution by graphing each set of lines. Be sure to use a straight edge.

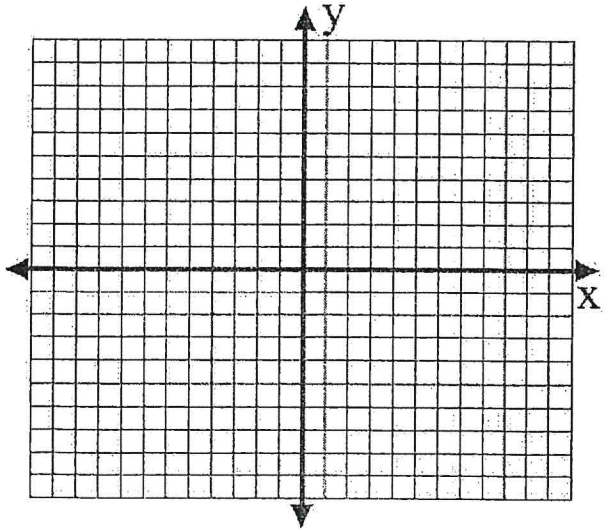
10. $x + y = 12$
$x - y = 4$



11. $2x - 6y = 22$
$4x + 6y = 8$



12. $x = 3y - 12$
$4x + 30 = 6y$



Solve for the indicated variable. You will not have real number answers on 16-19.

13. $a^2 + b^2 = c^2$ Solve for **a.**

14. $a = \left(\frac{b_1 + b_2}{2}\right)h$ Solve for b_2

15. $s = \pi r \ell + \pi r^2$ Solve for ℓ

16. $v = \frac{4\pi r^3}{3}$ Solve for **r.**

Simplify

17. $\sqrt{20}$

18. $\sqrt{150}$

19. $5\sqrt{18}$

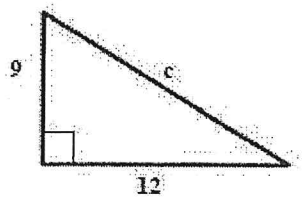
20. $\sqrt{12} * \sqrt{6}$

21. $\sqrt{15} * 3\sqrt{6}$

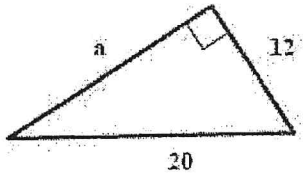
22. $7\sqrt{14} * 2\sqrt{21}$

Recall that you can find a missing side of a right triangle by applying the Pythagorean Theorem. Find the missing side of each right triangle. Leave your answers in simplest radical form. No decimals.

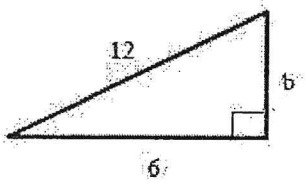
23. $c =$ _____



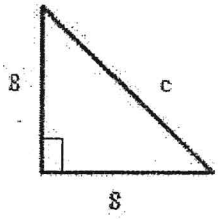
24. $a =$ _____



25. $b =$ _____



26. $c =$ _____



Factor the following quadratic equations.

27. $x^2 - 9x + 18 = 0$ **28.** $x^2 - 20 = 8x$ **29.** $2x^2 + 5x + 2 = 0$ **30.** $6x^2 - 11x - 10 = 0$

Examples for Summer Packet

A-D The five steps to solving an equation are:

- ✓ Get rid of parentheses
- ✓ Simplify the left side and the right side of the equation as much as possible, i.e. combine any and all like terms
- ✓ Get the variable term on just one side
- ✓ Get the variable term by itself
- ✓ Solve for the variable.

Remember, you always use the opposite operation to "get rid" of something.

E TO SOLVE AN EQUATION WITH fractions, we transform it into an equation without fractions -- which we know how to solve. The technique is called clearing of fractions

Multiply both sides of the equation -- every term -- by the LCM of denominators. Every denominator will then cancel. We will then have an equation without fractions.

Example:

$x + \frac{2}{3} = \frac{1}{2}$ Original equation.

$6\left(x + \frac{2}{3}\right) = 6\left(\frac{1}{2}\right)$ Multiply both sides by 6.

$6x + 6\left(\frac{2}{3}\right) = 6\left(\frac{1}{2}\right)$ On the left, distribute the 6.

$6x + 4 = 3$ Multiply: $6\left(\frac{2}{3}\right) = 4$, $6\left(\frac{1}{2}\right) = 3$.

Note that the fractions are now cleared from the equation. Now solve the problem.

F-G Slope Formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ Example: (1, -3) and (4, 5) $m = \frac{5 - -3}{4 - 1} = \frac{8}{3}$

H Slope intercept formula: $y = m\,x + b$ m is the slope and b is the y intercept

Special Cases:
Horizontal lines are y = a number slope is "0"
Vertical line x = a number slope is "No slope"

I Point slope formula: $y - y_1 = m(x - x_1)$

Example: $3x + 4y = 12$ *have to solve for y*

$-3x \quad -3x$ *subtract 3x from both sides to get y by itself*

$4y = -3x + 12$ next divide everything by 4

$\frac{4y}{4} = \frac{-3x}{4} + \frac{12}{4}$

$y = -\frac{3}{4}x + 3$ Slope is $-\frac{3}{4}$ y intercept is (0, 3) or 3

Use point slope when you have a point and slope and want an equation of a line in slope intercept. Solve the equation for y once the point(x_1, y_1) and slope(m) are plugged in.

Example: $y - (-2) = -\frac{2}{3}(x - 6)$ plug in ordered pair and slope

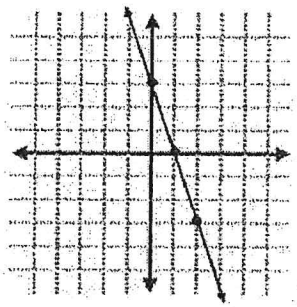
$y + 2 = -\frac{2}{3}x + 4$ Distribute

$-2 \quad -2$

$y = -\frac{2}{3}x + 2$ Solve for "y", now equation is in slope intercept form

J Graphing a line.

$y=-\frac{1}{3}x+3$	Equation
$m=-\frac{1}{3}$	Pull out slope and y-intercept
$b=3$ (y intercept)	Graph y-intercept
	Use slope to graph other points



When Graphing, take equation solve for slope intercept form, then use the steps from above.

K Multiplying Binomials: FOIL!

$$(2x-4)(3x+5)=6x^2+10x-12x-20=\underbrace{6x^2-2x-20}_{\text{combine like terms}}$$

First terms, Outer terms, Inner terms, last terms

$$(3x-4)^2=(3x-4)(3x-4)=9x^2-12x-12x+16=\underbrace{9x^2-24x+16}_{\text{combine like terms}}$$

First terms, Outer terms, Inner terms, last terms

L Factoring Examples:

1) $a^2-b^2=(a+b)(a-b)$ EX: $a^2-16=(a+4)(a-4)$; $25a^2-36x^4=(5a+6x^2)(5a-6x^2)$

2) $a^2+2ab+b^2=(a+b)^2$ EX: $k^2+10k+25=(k+5)(k+5)=(k+5)^2$

k^2 & 25 are perfect squares & $10=2(1\cdot5)$

3) $a^2-2ab+b^2=(a-b)^2$ EX: $4x^2-12x+9=(2x-3)(2x-3)=(2x-3)^2$

$4x^2$ & 9 are perfect squares & $12=2(2x\cdot3)$

4) ax^2+bx+c EX: $x^2+6x+8=(x+4)(x+2)$ since $4+2=6$ and $4\cdot2=8$

ax^2-bx+c $x^2-8x+15=(x-3)(x-5)$ since $^-3+^-5=^-8$ and $^-3\cdot^-5=15$

ax^2+bx-c $a^2+12a-45=(a+15)(a-3)$ since $15+^-3=12$ and $15\cdot^-3=^-45$

ax^2-bx-c $y^2-y-12=(y+3)(y-4)$ since $3+^-4=-1$ and $3\cdot^-4=^-12$

M Solve by factoring:

$a^2+12a-45=(a+15)(a-3)$ First factor the problem

$a+15=0$ *and* $a-3=0$ Make each factor equal to zero and solve for "x"

$-15\ \ -15$ $+3\ \ +3$

$a=-15$ $a=3$ Answer

N **Pythagorean Theorem $a^2 + b^2 = c^2$, a and b are the legs and c is the hypotenuse (longest side).**

$a=3, b=6, c=?$		$a=4, b=?, c=12$	
$a^2+b^2=c^2$	Pythagorean Theorem	$a^2+b^2=c^2$	Pythagorean Theorem
$3^2+6^2=c^2$	Plug in values	$4^2+b^2=12^2$	Plug in values
$9+36=c^2$	square numbers	$16+b^2=144$	square numbers
$45=c^2$	combine numbers	$b^2=120$	Get all numbers on one side
$\sqrt{45}=\sqrt{c^2}$	square root both sides	$\sqrt{b^2}=\sqrt{120}$	square root both sides
$6.71=c$	answer	$b=10.95$	answer

PAP Geometry
Summer Assignment

Name _____

This assignment should be completed without the use of a calculator
Show all work on separate paper for credit.

B. Solve each proportion

1. $\frac{4}{3} = \frac{8}{x}$
2. $\frac{7}{b+5} = \frac{10}{5}$
3. $\frac{5}{6} = \frac{7n+9}{9}$
4. $\frac{p+10}{p-7} = \frac{8}{9}$

D. Solve. Leave answers as improper fractions. (No decimals or mixed numbers).

1. $4(3n + 5) - 2(2 - 4n) = 6 - 2n$
2. $3x - 12 - 5x = 5 - 6x - 9$
3. $2(4x) - (x - 1) = 2(1 - x)$
4. $6x - 14 = 28$
5. $\frac{x}{5} = 12$
6. $\frac{1}{3}(6x + 24) - 20 = \frac{1}{4}(12x - 72)$
7. $13 - (2c + 2) = 2(c + 2) + 3c$
8. $\frac{1}{4}(8y + 4) - 17 = -\frac{1}{2}(4y - 8)$
9. $12 - 3(x - 5) = 21$
10. $\frac{x-12}{2} = 27$

E. Clear the fractions first, and then solve.

1. $\frac{2}{3}x - \frac{1}{6} = 7$
2. $\frac{2}{15} - \frac{3}{5}x = \frac{7}{15} + \frac{2}{3}x$
3. $\frac{2}{3}x - \frac{5}{6} = \frac{1}{2}x - 4$
4. $-\frac{1}{3}x - \frac{4}{3} = -\frac{3}{4}x - \frac{8}{5}$

F. Find the slope of the line containing each pair of points.

1. (5,0) and (6,8)
2. (4, 3) and (6, 4)
3. (2, 4) and (9, 7)

G. Find the slope of each line.

1. $y = 7$ 2. $x = -4$ 3. $2x + y = 15$ 4. $x - 2y = 7$

H. Find the equation of the line with the given slope through the given point. Write the answer in *slope-intercept* form.

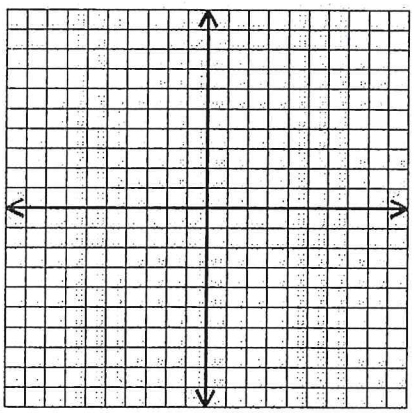
1. $m = -\frac{4}{3}$; (3, 1) 2. m = 4; (3, 2) 3. Undefined slope; (2, 1)

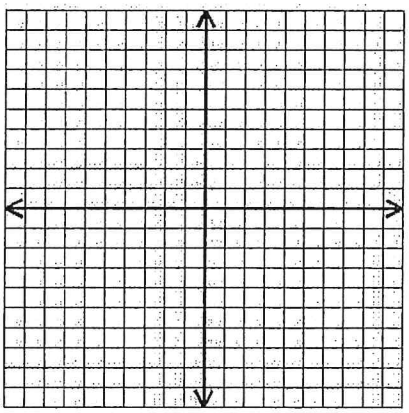
I. Write the equation of the line in slope-intercept form

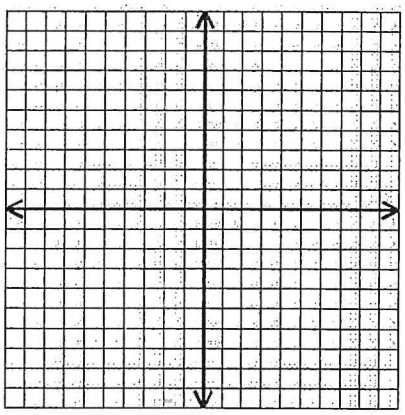
1. The line with x-intercept 4 and y-intercept of - 5
2. The line containing (0,3) and (2,0)
3. The line containing (3,1) and (4,8)
4. The line with slope $\frac{4}{5}$ and containing (-1,7)

J. Graph the following equations.

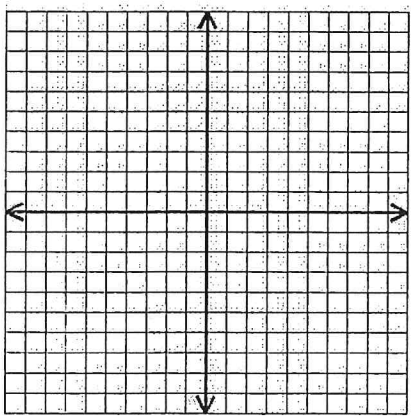
1. $y - 3 = 2(x - 1)$ 2. $y = -\frac{2}{5}x - 3$ 3. $3x - 2y = 12$

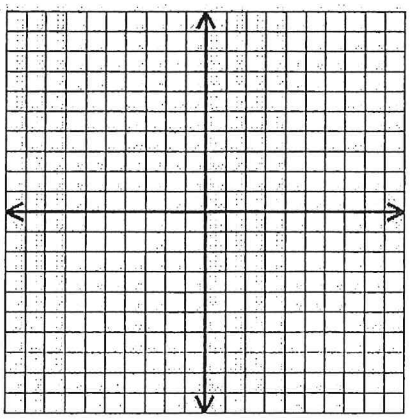


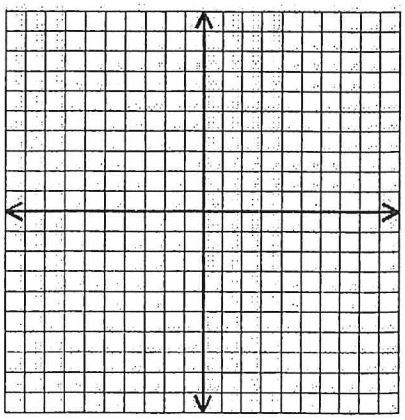




4. y = 3 **5. x = -1** **6. 4x + 6y = 12**







K. Multiply the following binomials.

1. $(x - 3)(x + 7)$
2. $(x + 8)^2$
3. $(x - 2)(x + 2)$
4. $(2x - 1)(5x + 3)$
5. $(2x - 3)^2$
6. $(7m - 1)(2m - 3)$

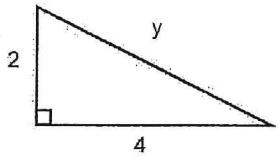
L. Factor each of the following polynomials.

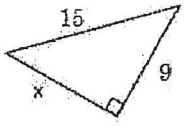
1. $x^2 + 8x + 15$
2. $a^2 - 14a + 48$
3. $x^2 + x - 42$
4. $x^2 - 7x - 18$
5. $x^2 - 16x + 64$
6. $x^2 - 81$

M. Solve by factoring:

1. $(k+ 5)(k - 5) = 0$
2. $y^2 - 10y + 21 = 0$
3. $x^2 - 81 = 0$
4. $x^2 + 7x + 6 = 0$
5. $x^2 + 3x = 8x - 6$
6. $16p^2 - 25 = 0$

N. Use Pythagorean Theorem to find the missing side of the right triangles. If c is the measure of the hypotenuse of a right triangle, find each missing measure. Round to the nearest hundredth if necessary.

1. $a = 5, b= 12, c = ?$
2. $a = 6, b = 3, c = ?$
3. $a = ?, b = 6, c = 14$
4. $a = 4, b = ?, c = 10$
5. 

6. 

7. In little league baseball, the distance of the paths between each pair of consecutive bases is 60 feet and the paths form right angles. How far does the ball need to travel if it is thrown from home plate directly to second base?