AMERICAN SCHOOL OF KUWAIT
MATHEMATICS DEPARTMENT

HONORS GEOMETRY SUMMER ASSIGNMENT 2019

The problems in this packet are designed to help you review topics from Algebra I that are important to your success in Honors Geometry. The topics covered in this packet should be addressed and reviewed before entering Geometry. Examples have been provided in each section to help you get started and refresh your memory of these concepts.

This packet is due on **the first day of class**. Following a review of the assignment, you will have **a summative assessment** on this material **within the first week of class**. This assignment should be done in pencil. **You may not use calculators.**

Name_____ Date_____

TOPIC 1: ORDER OF OPERATIONS

NOTES:

Order of Operations:

1. Parentheses
2. Exponents
3. Multiply or Divide
4. Addition or Subtraction

Grouping Symbols { [( )] }	Exponents x^2	Multiply ×	Addition +
		Divide ÷	Subtraction -

PROBLEM SET: **Simplify.**

1) $6+3(4)$

2) $6+7\cdot 10$

3) $(2)(8)\bullet(3)(5)$

4) $17-\left[4+2\bullet 3\right]$

5) $32-\left[5(30\div 5)+1\right]+7$

6) $50-2(16-2\bullet 6)^2$

7) $5+\left[4\bullet 3(2+1)\right]$

8) $\left[\dfrac{6\bullet 2(8-3)}{11+4}\right]\bullet 6$

9) $8\left(\dfrac{6+24}{3+2\bullet 6}\right)^3$

TOPIC 2: SOLVING EQUATIONS

EXAMPLES: **Solve for x.**

$15x+20+5x+8=-5-7$

$20x+28=-12$	Comb. Like Terms
$-28=-28$	Subtract 28.
$\frac{20x}{20}=\frac{-40}{20}$	Simplify.
$x=-2$	Divide by 20.
	Simplify.

$7(x-3)=8x+2$

$7x-21=8x+2$	Distribute.
$-7x=-7x$	Subtract $7x$.
$-21=x+2$	Simplify.
$-2=-2$	Subtract 2.
$-23=x$	Simplify.

$x^2-2=34$	
$+2=+2$	Add 2.
$x^2=36$	Simplify.
$\sqrt{x^2}=\sqrt{36}$	Square Root
$x=\pm 6$	

PROBLEM SET - **Solve for x. Show all work. Answers must be in simplified fractions if applicable.**

1) $12+x=5$

2) $-2=7-x$

3) $12=-3x$

4) $9x-1=44$

5) $2x-6=4x-14$

6) $5x-2-3=25$

7) $2x+7+8x=-5+18$

8) $\frac{4}{5}x=8$

9) $\frac{1}{3}x-4=7$

10) $3(x+7)-2x=23$

11) $0.25x-0.35=1.15$

12) $\frac{1}{4}x+2=-\frac{2}{3}$

13) $-2x+\frac{1}{2}=-2$

14) $x^2=49$

15) $x^2+4=40$

16) $\frac{x}{8}=\frac{20}{32}$

17) $\frac{5}{9}=\frac{12}{x}$

18) $\frac{x}{8}=\frac{x+1}{6}$

19) $\frac{10}{x-2}=\frac{5}{3}$

TOPIC 3: EXPONENTS

NOTES & EXAMPLES:

An expression like 5^3 is called a power. The exponent 3 represents the number of times the base 5 is used as a factor: $5^3 = 5 \cdot 5 \cdot 5$ (3 as a factor of 5). To simplify expressions involving exponents, you often use properties of exponents. Let *a* and *b* be numbers and let *m* and *n* be integers.

Rules of Exponents		Examples
• Adding/Subtracting	$a^m + a^m = 2a^m$	$5x^3 + 3x^3 - 4x^2 = 8x^3 - 4x^2$
• Product of Powers Property	$a^m \cdot a^n = a^{m+n}$	$4^2 \cdot 4^7 = 4^{2+7} = 4^9$
• Zero Power Property	If $a \neq 0$, then $a^0 = 1$	$(5x^3)^0 = 1$

PROBLEM SET: **Simplify the expression using rules of exponents.**

1) $4x^2 + 3x - 6x - 2$

2) $(3x^3 - 2x + 6) + (3x^2 - 4x + 1)$

3) $x^3 - 6x^2 - 7 - 4x^3 - x + 7$

4) $(8x^2 - 3x + 11) - (2x^2 - 5x - 4)$

5) $(9x^2y^3 + 4x^3y^2 - 2x^2y^2) - (6x^3y^2 - 2x^2y^3)$

6) $3x^2 \cdot 3x^2$

7) $x^6y^2 \cdot x^3yz^8 \cdot 4yz$

8) $(3a^4b^3)^0 + a^2b^3$

TOPIC 4: RADICALS

NOTES & EXAMPLES

If $a^2 = b$, then b is the square root of a. If x represents any positive real number, then the expression $\sqrt{x}$ is the positive square root of x. It is the *positive* number we square to get x. The expression $-\sqrt{x}$ is the negative square root of *x*. It is the negative number we square to get *x*. For example, The positive square root of 25 is 5 and can be written $\sqrt{25} = 5$. The negative square root of 25 is -5 and can be written $-\sqrt{25} = -5$. Zero has just one square root: $\sqrt{0} = 0$. Negative numbers do not have a square root; $\sqrt{-25} = \varnothing$ (no solution in the real numbers). Some square roots are decimals: $\sqrt{46} \approx 6.78$.

PROBLEM SET: **Simplify.**

1) $\sqrt{50}$ 2) $\sqrt{81}$ 3) $\sqrt{0}$ 4) $\sqrt{-49}$

TOPIC 5: FRACTIONS & DECIMALS

NOTES & EXAMPLES

To convert a fraction into a decimal, divide the numerator by the denominator. $\frac{4}{5} = 4 \div 5 = 0.8$. When using a calculator to solve remember, "top divided by bottom".

To convert a decimal to a fraction is a bit more complicated. Any numbers to the left of the decimal point are whole numbers and are the large numbers in a mixed fraction. All numbers to the right are made into a fraction. Put a 1 in the denominator and a zero under every number in the numerator. Then simplify the fraction. For example: $4.625 = 4\frac{625}{1000} = 4\frac{5}{8}$. "1000" is in the denominator because it has three zeros to correspond to the three numbers in the numerator.

PROBLEM SET: **Convert the fractions to decimals and the decimals to fractions.**

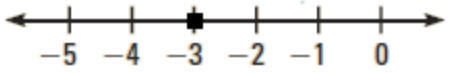
1) $\frac{4}{10}$ 2) $\frac{10}{4}$ 3) $\frac{4}{3}$ 4) $\frac{45}{86}$

5) 2.75 6) 0.7 7) 4.375 8) 0.0001

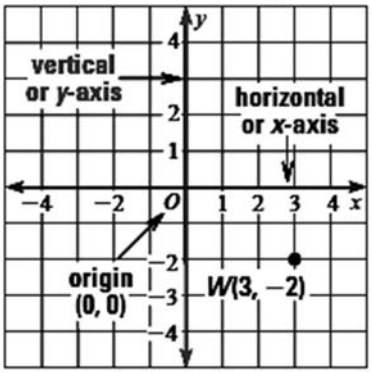
TOPIC 6: PLOTTING POINTS

NOTES & EXAMPLES

In one dimension, plot the points on a number line. For example $x = -3$ would be represented by the following:

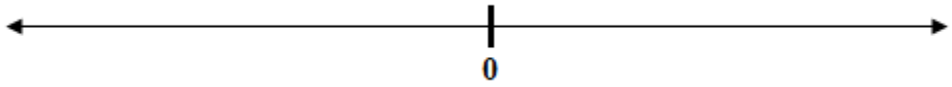


In two dimensions, plot the points on the coordinate plane. The coordinate plane is made-up of the horizontal *x-axis* and the vertical *y-axis*. Each point in the coordinate plane corresponds to an ordered pair of real numbers. For example, the ordered pair *W*(3, -2), has an *x*-coordinate of 3 and a *y*-coordinate of -2. It would be represented by the following:



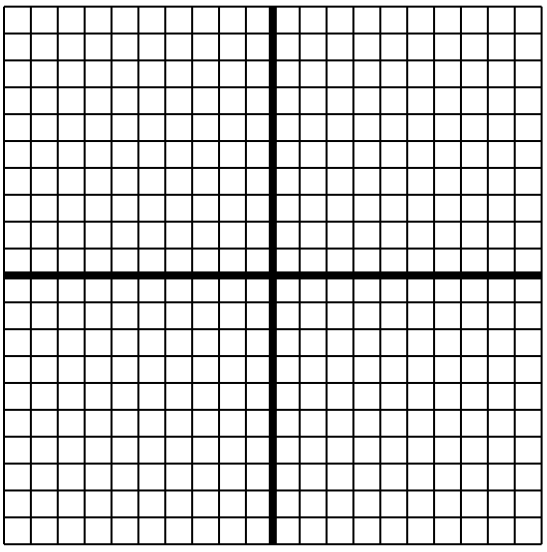
PROBLEM SET: **Put numbers on the number line and plot the following.**

1) $x = -4$ 2) $x = 3$ 3) $x = 3.5$ 4) $x = -0.5$ 5) $x = \frac{5}{2}$



PROBLEM SET: **Plot the following points on the coordinate plane.**

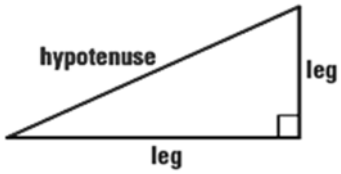
1) $(4,8)$ 2) $(-2,10)$ 3) $(-4,-6)$ 4) $(7,-3)$ 5) $(-10,0)$ 6) $(0,6)$



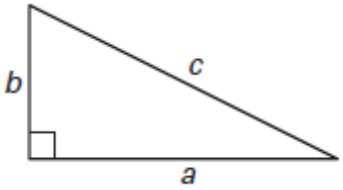
TOPIC 7: RIGHT TRIANGLES

NOTES:

In a right triangle, the sides that form the right angle are the *legs* of the triangle. The side opposite the right angle is the *hypotenuse* of the triangle.



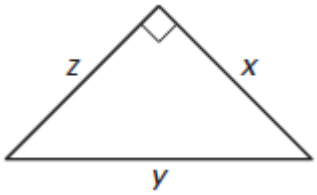
EXAMPLE: **Identify the legs and hypotenuse in the triangles below.**



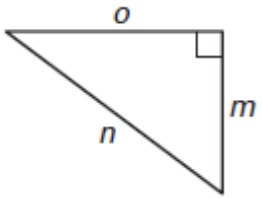
Side a: Leg
Side b: Leg
Side c: Hypotenuse

PROBLEM SET: **Identify the legs and hypotenuse in the triangles below.**

1)



2)



3)