Westside

Summer Packet

Geometry PREP

IMPORTANT INSTRUCTIONS FOR STUDENTS!!!

We understand that students come to Geometry with different strengths and needs. For this reason, students have options for completing the packet and getting assistance!

- **Students should try to answer all the questions if possible; you must show all work.**
- **Students must answer a minimum of 80%(80 problems) of the questions to receive full credit.**
- **So, if you really can't answer certain questions, students may write the word "pass" on up to 10% (10 problems) of the questions without penalty. (The purpose of this option is to allow students to show what they know on certain concepts while informing the teacher of concepts that may need to be reviewed with students after school starts).**
- **Targeted Geometry tutorial videos will be posted on the WHS website under Mr. Schroeder website on the "Summer Packet Tutorial" page. www.houstonisd.org/Page/74104**
- **Khan Academy video tutorials may be very helpful to you. HISD has aligned Khan Academy with Algebra I, are available by clicking this link: http://www.houstonisd.org/cms/lib2/TX01001591/Centricity/Domain/8050/Khan_Acad_Video_Algmt_Alg1.pdf**
- **For help with fractions go to: http://www.khanacademy.org/math/arithmetic/fractions**
- **Need face-to-face help with packet? Come to WHS on August 25th between 1-3pm! WHS Geometry teacher(s) will be on hand to give you assistance!**
- **There will be a test over this material on or before September 8, 2017.**
- **Finally, honor and integrity is at the heart of a Westside Wolf! Smart wolves never cheat. You are only hurting yourself by attempting to copy someone else's work. This packet is to help you be ready for Geometry and help your teachers know what you can do.**
- **All existing and new students who are enrolled at WHS on or before August 17th, must submit their summer packet to their math teacher no later than Friday, September 1, 2017.**
- **Students who enrolled at Westside High School on or after August 19th, must submit their summer packet within two weeks of their enrollment date at Westside.**

Now! Get Ready, Get Set, and Do Your Best!

A. Reduce each fraction to lowest terms.

1. $\frac{14}{28}$ 2. $\frac{27}{18}$ 3. $\frac{8}{32}$ 4. $\frac{120}{200}$ 5. $\frac{56}{20}$

B. Find the equivalent fraction.

1. $\frac{2}{3}=\frac{\ }{9}$ 2. $\frac{9}{8}=\frac{\ }{24}$ 3. $\frac{5}{6}=\frac{\ }{12}$ 4. $\frac{5}{3}=\frac{\ }{15}$ 5. $\frac{7}{4}=\frac{\ }{32}$

C. Add or Subtract. Make sure your final answer is reduced to lowest terms.

1. $\frac{2}{7}+\frac{3}{7}$ 2. $-\frac{1}{2}+\frac{3}{7}$ 3. $\frac{1}{8}-\frac{3}{4}$ 4. $\frac{4}{9}-\frac{1}{6}$ 5. $1\frac{3}{4}+2\frac{3}{8}$

For help with solving go to: http://www.khanacademy.org/math/arithmetic/absolute-value

D. Simplify

1. 4 + (-11) 2. -7 + 3 3. -12 + (-18) 4. 9 – 17

5. 12 – (-11) 6. (-21) – (-32) 7. 4(-9) 8. (-7)(-6)

9. $63\div(-9)$ 10. $-48\div(-4)$ 11. $\frac{-72}{8}$ 12. $\frac{48}{-8}$

For help with slope go to:
http://www.khanacademy.org/math/trigonometry/graphs/slope_of_line/v/slope-of-a-line

E. 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 $(-9,-7)$

F. Find the slope of each line.

4. $y=7$ 5. $x=-4$ 6. $2x+y=15$ 7. $x-2y=7$

For help with slope-intercept go to: http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/equation-of-a-line/e/slope_intercept_form

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

8. $m=4$; $(3,2)$

9. $m=-2$; $(4,7)$

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

H. Find the equation of the line containing the following points. Write answer in *standard form*.

11. $(2,6)$ and $(4,1)$

12. $(3,5)$ and $(-5,3)$

13. $(-2,-3)$ and $(-4,-6)$

I. Write the equation of the line in standard form.

14. The line with x-intercept 4 and y-intercept of -5.

15. The line containing $(0,3)$ and $(-2,0)$.

J. Write the equation of the line in point-slope form.

16. The line containing $(-3,-2)$ and $(5,2)$.

17. The horizontal line passing through $(2,5)$.

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

18. The line containing $(3,1)$ and $(4,8)$.

19. The line containing $(3,3)$ and $(-6,9)$.

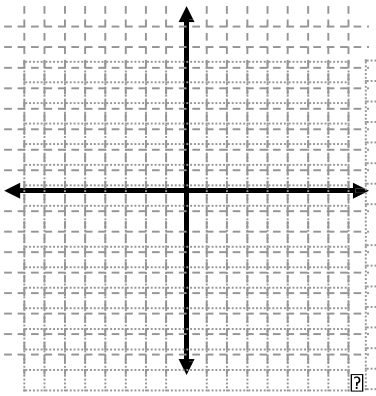
20. The line with slope $\frac{4}{5}$ and containing $(-1,7)$.

For help with graphing: http://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/graphs-of-linear-equations

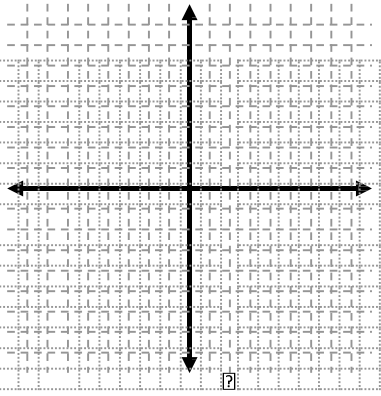
L. Point-Slope Form

Graph the following equations. Graph three points and label the line with its equation.

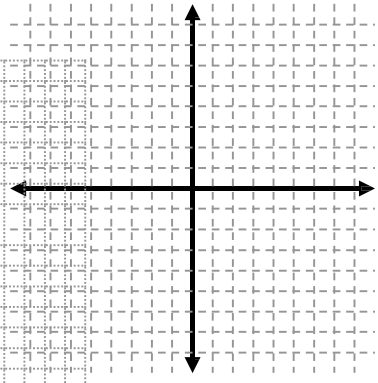
1. $y-3=2(x-1)$



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

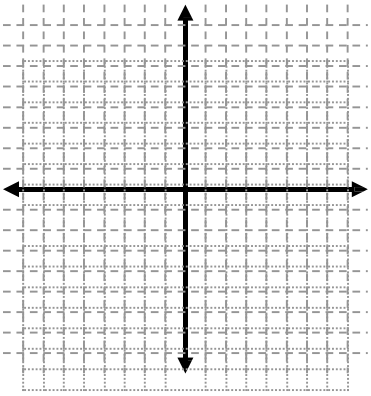


3. $y-4=-3(x-5)$

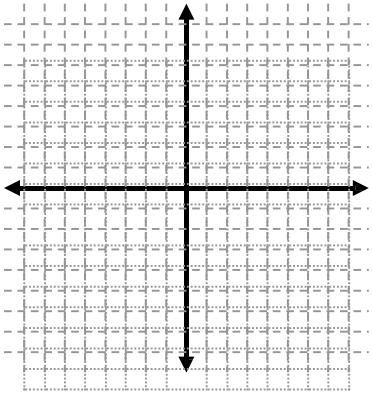


M. Slope-Intercept Form

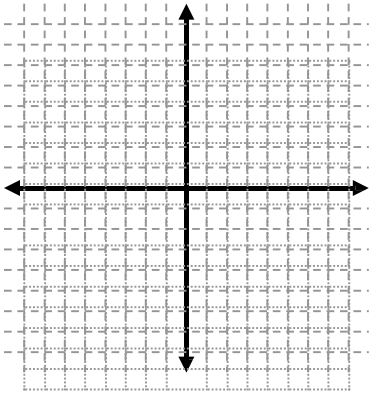
1. $y=2x-3$



2. $y=\frac{1}{2}x-5$

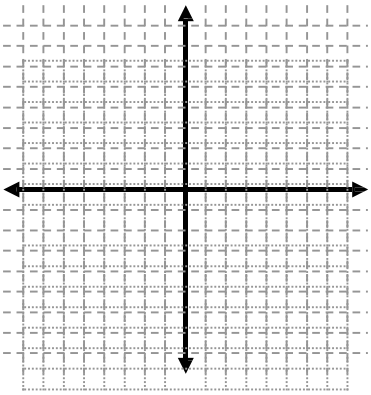


3. $y=-2x+3$

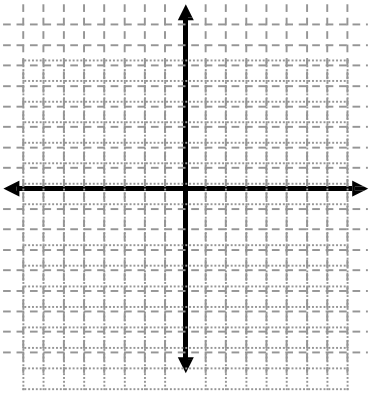


N. Standard Form

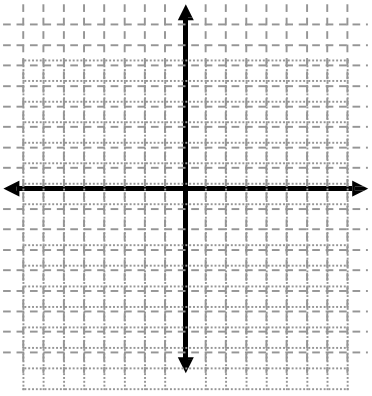
1. $4x+2y=8$



2. $x-3y=6$



3. $4x+6y=12$



For help with order of operations go to: http://www.khanacademy.org/math/arithmetic/multiplication-

division/order_of_operations/v/introduction-to-order-of-operations

O. Simplify each expression using appropriate Order of Operations.

1. $1 \cdot 5 - 6 \div 2 + 3^2$
2. $125 \div \left[5\left(2+3\right)\right]$
3. $4 + 2\left(10 - 4 \cdot 6\right)$
4. $3\left(2+7\right)^2 \div 5$
5. $12\left(20-17\right) - 3\ 6$ •
6. $3^2 \div 3 + 2^2\ 7 - 20 \div 5$ •

For help with binomials go to:
http://www.khanacademy.org/math/algebra/polynomials/multiplying_polynomials/v/multiplying-monomials

P. Multiply the following binomials.

1. $\left(x+3\right)\left(x+4\right)$
2. $\left(2x+1\right)\left(x+4\right)$
3. $\left(6x+5\right)\left(2x-1\right)$
4. $\left(x-4\right)\left(x+4\right)$
5. $\left(x-6\right)^2$
6. $\left(6x+5y\right)^2$

For help with Pythagorean theorem go to:
http://www.khanacademy.org/math/geometry/right_triangles_topic/pyth_theor/v/the-pythagorean-theorem

Q. 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. $a=5,\ b=8,\ c=?$
4. $a=?,\ b=10,\ c=11$
5. $a=\sqrt{\ }5,\ b=?,\ c=\sqrt{30}$
6. $a=?,\ b=6,\ c=14$
7. $a=4,\ b=?,\ c=10$
8. $a=?,\ b=7,\ c=10$
9. $a=\sqrt{\ }7,\ b=\sqrt{\ }9,\ c=?$

For help with exponents go to: http://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/negative-and-positive-exponents

T. Simplify each problem using exponent rules

1. $x^3 \cdot x^6 =$ _____
2. $c \cdot c^5 \cdot c^2 =$ _____
3. $x^5 \cdot x^6 \cdot x^7 =$ _____
4. $(2a^4)(5a^3) =$ _____
5. $(-2xy^2)(-3x^2y) =$ _____
6. $(3cd^4)(-2c^2)(4cd^2) =$ _____
7. $(a^2)^3 =$ _____
8. $(x^4)^3 =$ _____
9. $(u^3)^6 =$ _____
10. $(5a)^2 =$ _____
11. $(-6x)^2 =$ _____
12. $(-3t)^3 =$ _____

For help with solving go to: http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/exp_unknown_vars/v/evaluating-expressions-where-individual-variable-values-are-unknown

U. Solve for the variable in each problem.

1. $5(3x-2)=35$
2. $2(6x+24)-20=-4(12x-72)$
3. $5r-2(2r+8)=16$
4. $13-(2c+2)=2(c+2)+3c$
5. $4(8y+4)-17=-2(4y-8)+13$
6. $12-3(x-5)=21$
7. $-8=-(x+4)$
8. $-(7-4x)=9$
9. $2(4x-3)-8=4+2x$
10. $-18-6k=6(1+3k)$
11. $-(1+7x)-6(-7-x)=36$
12. $-3(4x+3)+4(6x+1)=43$

13. $-5(1-5x)+5(-8x-2)=-4x-8x$

Examples for Summer Packet Westside High School

E. Slope formula $m=\frac{y_2-y_1}{x_2-x_1}$ Ex: $(1,-3)$ and $(4,5)$ $m=\frac{5-(-3)}{4-1}=\frac{8}{3}$

G. Slope intercept formula: $y = m\,x + b$

Example: $3x+4y=12$

$-3x \quad -3x$

$4y=-3x+12$

$\frac{4}{4}\quad\frac{}{4}\quad\frac{}{4}$

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

slope y-intercept

3

Slope is $-\frac{}{4}$

y-intercept is $(0,3)$

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

J. Point slope formula: $y - y_1 = m\,(x - x_1)$ (y of 1, slope, x of 1)

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 and slope are plugged in.

ordered pair ordered pair

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

H. Use examples from A to find slope. Take slope and one of the points and plug into point slope, and use example from C. Once equation is in slope intercept, get x and y on one side and multiply by common denominator of x and y, so that there is not any fractions.

Example: $(3,-2)$ and $(6,0)$

$m=\frac{0-(-2)}{6-3}=\frac{2}{3}$

$y-(-2)=\frac{2}{3}(x-3)$

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

3

$-2 \quad -2$

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

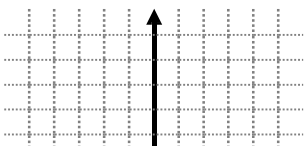
$y=\frac{2}{3}x-4$

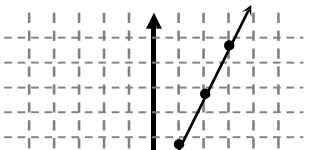
$3\left(\frac{2}{3}x-y=-4\right)$

$\left(\frac{}{3}\right)$

$2x-3y=-12$

L. Graph from point slope, $y - y_1 = m\,(x - x_1)$ (y of 1, slope, x of 1)





ordered pair	ordered pair

$y + 3 = 2(x + 1)$ Equation

$(-1, -3)$ $m = 2$ Pull out point and slope from equation.
Plot point
Use slope to plot other points
Draw line

Slope is $\frac{rise}{run}$ $\begin{cases} + = up \text{ or } \\ - = down \end{cases}$ $= 2up \text{ and } 1right$ $\begin{cases} + = right \\ - = left \end{cases}$ 1

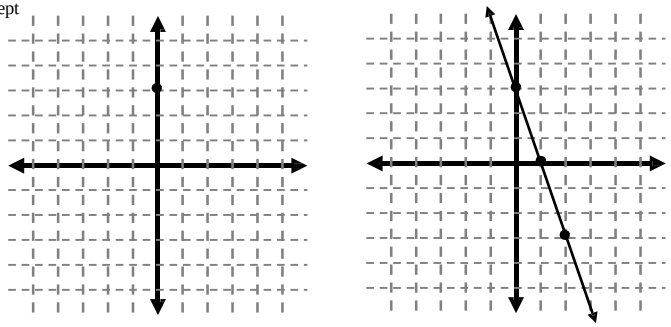
M. Graphing from slope intercept, $y = mx + b$

slope y-intercept

$y = -\frac{1}{3}x + 3$ Equation

$m = -\frac{1}{3}$ $(0,3)$ Pull out slope and y-intercept

Graph y-intercept
Use slope to graph other points



N. Graphing from standard form, $Ax + By = C$

Take equation solve for slope intercept form, then use the steps from I.

O. *PEMDAD* = **P**arentheses, **E**xponents, **M**ultiplication/**D**ivision, **A**dd/**S**ubtract from left to right

U. 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.

P. Multiplying binomials

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

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

Q. 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

T. Examples: $x^2 \cdot x^5 = x^{2+5} = x^7$ $\quad c^6 \cdot c^3 = c^{6+3} = c^9$ $\quad a \cdot a^5 = a^{1+5} = a^6$

Examples: $(2x^3)(4x^4) = (2 \cdot 4)(x^{3+4}) = 8x^7$

Examples: $(x^2)^4 = (x^2) \cdot (x^2)(x^2)(x^2) = (x^{2+2+2+2}) = x^8$

$(u^3)^5 = (u^3) \cdot (u^3)(u^3)(u^3) \cdot (u^3) = (u^{3+3+3+3+3}) = u^{15}$

Examples: $(2x)^4 = (2x)(2x)(2x)(2x) = (2 \cdot 2 \cdot 2 \cdot 2)(x^{1+1+1+1}) = 16x^4$

$(-6k)^3 = (-6k)(-6k)(-6k) = (-6 \cdot -6 \cdot -6)(k^{1+1+1}) = -216k^3$