June 2025

Dear Incoming Eighth Grader,

Here is your summer math packet to help you retain your math skills over the summer. This packet covers topics we did this year and will prepare you for next year. Please show all work and simplify when applicable. The packet is due on Friday, August 29, 2025.

Next year we will be studying Algebra, should you have any questions you can email me at rkraus@stmarybethelct.org.

Have a wonderful summer. See you in August.

Sincerely,

Mrs. Kraus

Mrs. Kraus

Kuta Software - Infinite Algebra 1

Name___________________________________

Using the Distributive Property

multiply outside # by both terms inside parenthesis & add

Date__________________ Period____

Simplify each expression.

1) $-6(a+8)$ $= -6(a) + -6(8)$

$= -6a - 48$

list variable term (term with letter) before constant (number)

2) $4(1+9x)$

3) $6(-5n+7)$

4) $(9m+10)\cdot 2$

5) $(-4-3n)\cdot -8$ $= (-8)(-4) + (-8)(-3n)$

$= 32 + 24n$

list variable term first, then #

$= 24n + 32$

6) $8(-b-4)$

7) $(1-7n)\cdot 5$

8) $-6(x+4)$

9) $5(3m-6)$

10) $(-6p+7)\cdot -4$

11) $5(b-1)$

12) $(x+9)\cdot 5$

13) $-4(-8x-8)$

14) $-6(7+x)$

15) $-3(x-5)$

16) $-5(10x+1)$

17) $(1+2v)\cdot 5$

18) $-8(1-5x)$

19) $-7(5k-4)$

20) $-5(7a-6)$

21) $5(n+6)$

22) $4(3r-8)$

23) $3(5+5x)$

24) $(1+9x)\cdot -10$

Kuta Software - Infinite Algebra 1

Remember integer rules

Name

Combining Like Terms = add variable terms with ~~variable terms~~

C.L.T.

Date Period

Simplify each expression. add #'s with #'s, list variable term first, then #

1) $-6k + 7k$ = $-6k + 7k$ = $1k$ or k

2) $12r - 8 - 12$

3) $n - 10 + 9n - 3$

4) $-4x - 10x$

5) $-r - 10r$

6) $-2x + 11 + 6x$

7) $11r - 12r$

8) $-v + 12v$

9) $-8x - 11x$

10) $4p + 2p$

11) $5n + 11n$

12) $n + 4 - 9 - 5n$

$\underline{1n} + 4 - 9 - \underline{5n}$ = $1n - 5n = -4n$

$4 - 9 = -5$

answer = $-4n - 5$

13) $12r + 5 + 3r - 5$

14) $-5 + 9n + 6$

15) $n - 4 - 9$

16) $4n - n$

17) $-3x - 9 + 15x$

18) $-9k + 8k$

19) $-16n - 14n$

20) $15n - 19n$

21) $-4 + 7(1 - 3m)$ Distribute first then C.L.T.

$-4 + 7 - 21m = 3 - 21m$

$= -21m + 3$

22) $-5n + 3(6 + 7n)$

23) $-2n - (9 - 10n)$

$-2n - 1(9 - 10n)$

$-2n - 9 + 10n = 8n - 9$

24) $10 - 5(9n - 9)$

25) $9a + 10(6a - 1)$

26) $-9(6m - 3) + 6(1 + 4m)$

27) $-10(1 - 9x) + 6(x - 10)$

28) $5(-2n + 4) + 2(n + 3)$

29) $-3(10b + 10) + 5(b + 2)$

30) $-7(n + 3) - 8(1 + 8n)$

Kuta Software - Infinite Pre-Algebra

Name________________________________

Exponents and Multiplication $x^a \cdot x^b = x^{a+b}$ = product rule

Date________________ Period____

same base add exponent

Simplify. Your answer should contain only positive exponents.

1) $4^2 \cdot 4^2$ $= 4^{2+2} = 4^4$

$= 4 \cdot 4 \cdot 4 \cdot 4$

$= 256$

2) $4 \cdot 4^2$

$4^1 \cdot 4^2 =$ same base (4)

copy base add exponent

$= 4^{1+2} = 4^3 = 4 \cdot 4 \cdot 4 = 64$

3) $3^2 \cdot 3^2$

4) $2 \cdot 2^2 \cdot 2^2$

5) $2n^4 \cdot 5n^4$

6) $6r \cdot 5r^2$

7) $2n^4 \cdot 6n^4$ multiply coefficients

$(2)(6) = 12$

$n^4 \cdot n^4 = n^8$ $= 12n^8$

8) $6k^2 \cdot k$

9) $5b^2 \cdot 8b$

10) $4x^2 \cdot 3x$

11) $6x \cdot 2x^2$

12) $6x \cdot 6x^3$

13) $7v^3 \cdot 10u^3v^5 \cdot 8uv^3$

multiply #'s
multiply like variables

$7 \cdot 10 \cdot 8 = 560$

$v^3 \cdot v^5 \cdot v^3 = v^{11}$

$u^3 \cdot u^1 = u^4$

$= 560u^4v^{11}$

14) $9xy^2 \cdot 9x^5y^2$

15) $6m^3n^3 \cdot 8m^2n^3$

16) $6x^2 \cdot 6x^3y^4$

17) $7u^2v^5 \cdot 9uv^3$

18) $uv \cdot 4uv^5$

19) $10xy^3 \cdot 8x^5y^3$

20) $3u^4v^5 \cdot 7u^2v^3$

21) $(2x^2)^2$

power Rule

$(x^a)^b = x^{a \cdot b}$

$(2^2)(x^2)^2$

$4x^{2 \cdot 2} = 4x^4$

22) $(p^4)^4$

23) $(k^3)^4$

24) $(7k)^2 = 7^2k^2 = 49k^2$

25) $(x^2)^3$

26) $(2b^2)^4$

Kuta Software - Infinite Pre-Algebra

Name______________________________

Exponents and Division

Quotient Rule $\frac{x^a}{x^b} = x^{a-b}$

Date________________ Period____

Simplify. Your answer should contain only positive exponents.

1) $\frac{5^4}{5}$ $= \frac{5^4}{5^1} = 5^{4-1} = 5^3$
$= 5 \cdot 5 \cdot 5$
$= 125$

2) $\frac{3}{3^3}$

3) $\frac{2^2}{2^3}$

4) $\frac{2^4}{2^2}$

5) $\frac{3r^3}{2r}$

6) $\frac{7k^2}{4k^3}$

7) $\frac{10p^4}{6p}$ $\frac{10}{6} = \frac{5}{3}$
$\frac{p^4}{p^1} = p^{4-1} = p^3$
$= \frac{5}{3}p^3$

8) $\frac{3b}{10b^3}$

9) $\frac{8m^3}{10m^3}$

10) $\frac{7n^3}{2n^5}$

11) $\frac{2n^2}{n}$

12) $\frac{8x^3}{10x^5}$

13) $\frac{12x^3}{9y^8}$

14) $\boxed{\frac{14x^4y^7}{6x^5y^4}}$

$\frac{14}{6}=\frac{7}{3}$

$\frac{x^4}{x^5}=x^{4-5}=x^{-1}$

$\frac{y^7}{y^4}=y^{7-4}=y^3$

$=\frac{7}{3}x^{-1}y^3=\frac{7y^3}{3x^1}$

can't have negative exponents

15) $\frac{11u^4}{17u^7v^9}$

16) $\frac{4y^4}{14yx^8}$

17) $\frac{12yx^4}{10yx^8}$

18) $\frac{18x^8y^8}{10x^3}$

19) $\frac{5n^8}{20n^8}$

20) $\frac{16yx^4}{9x^8y^2}$

Kuta Software - Infinite Pre-Algebra

Name___________________________________

Powers of Products and Quotients

Date________________ Period____

$(x^a)^b = x^{a \cdot b}$

Simplify. Your answer should contain only positive exponents.

1) $(3a^2)^3$ $= 3^3 \cdot (a^2)^3$
$= 3^3 a^6 = 27a^6$

2) $(2n^4)^4$ $= 2^4 n^{4 \cdot 4} = 2 \cdot 2 \cdot 2 \cdot 2 n^{16}$
$16n^{16}$

3) $(3x^4)^4$

4) $(6b^2)^2$

5) $(7y^4)^2$

6) $(3ab^4)^4$

7) $(2x^4y^4)^3$

8) $(5mn^3)^3$

9) $(x^2y^2)^2$

10) $(6yx^4)^2$

11) $(u^4v^3)^2$

12) $(2x^4y^4)^4$

13) $(3x^2 \cdot 2x^2)^2$ do operation inside ( ) first
$3x^2 \cdot 2x^2 = 6x^4$
$= (6x^4)^2 = 6^2(x^4)^2$
$= 36x^8$

14) $(2p^3 \cdot 2p)^2$

15) $(4n^3 \cdot n^2)^2$

16) $(3x \cdot 2x)^2$

17) $(4x^4 \cdot x^4)^3$

18) $(4n^4 \cdot n)^2$

Kuta Software - Infinite Pre-Algebra

Name____________________________________

Multi-Step Equations

Date________________ Period____

Solve each equation.

1) $6a + 5a = -11$

$11a = -11$

$\frac{11a}{11} = \frac{-11}{a}$

$a = -1$

2) $-6n - 2n = 16$

① Distribute
② C.L.T. Combine Like Terms
③ A/S undo
④ M/D undo

3) $4x + 6 + 3 = 17$

4) $0 = -5n - 2n$

5) $6r - 1 + 6r = 11$

6) $r + 11 + 8r = 29$

7) $-10 = -14v + 14v$

8) $-10p + 9p = 12$

9) $42 = 8m + 13m$

10) $a - 2 + 3 = -2$

11) $18 = 3(3x - 6)$

12) $30 = -5(6n + 6)$

$30 = -30n - 30$

$+30 \qquad +30$

$60 = -30n$

$\frac{+60}{-30} = \frac{-30n}{-30}$

$n = -2$

13) $37 = -3 + 5(x + 6)$

14) $-13 = 5(1 + 4m) - 2m$

15) $4(-x + 4) = 12$

16) $-2 = -(n - 8)$

17) $-6(1 - 5v) = 54$

18) $8 = 8v - 4(v + 8)$

19) $10(1 + 3b) = -20$

20) $-5n - 8(1 + 7n) = -8$

21) $8(4k - 4) = -5k - 32$

22) $-8(-8x - 6) = -6x - 22$

23) $8(1 + 5x) + 5 = 13 + 5x$

24) $-11 - 5a = 6(5a + 4)$

Kuta Software - Infinite Pre-Algebra

Name________________________________

Graphing Lines in Slope-Intercept Form

Date__________________ Period____

$y = mx + b$

m = slope

b = y intercept $(0, b)$

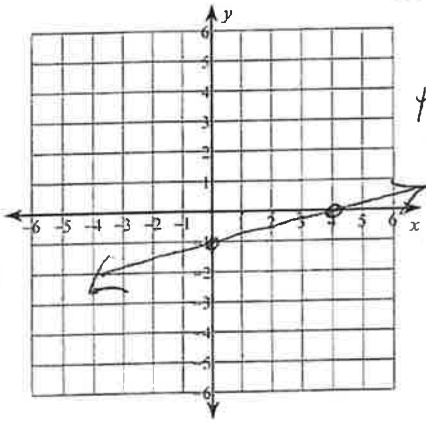
Sketch the graph of each line.

1) $y = \frac{1}{4}x - 1$ $=$ $m = \frac{1}{4}$, $b = -1 = (0,-1)$

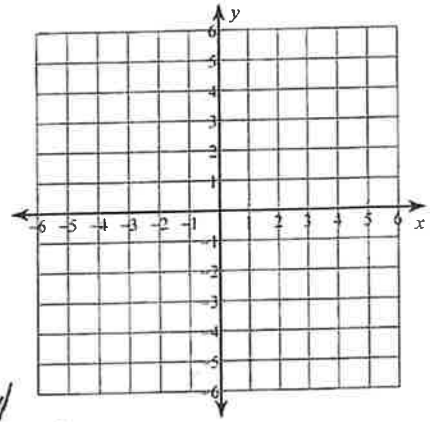
graph b first on y axis then look at m and go up/down accordingly and then go over (to the right) based on the denominator

$m = \frac{1}{4}$

$\frac{\text{up } 1}{\text{over } 4}$



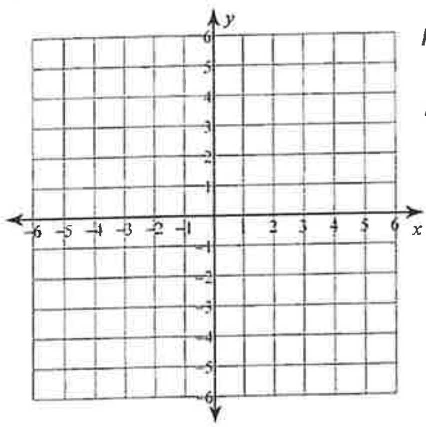
2) $y = -x + 2$



$m =$

$b =$

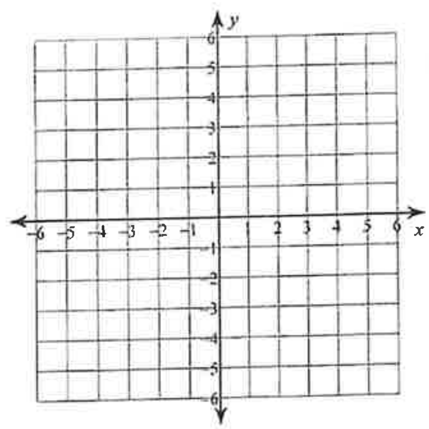
3) $y = x + 1$



$m =$

$b =$

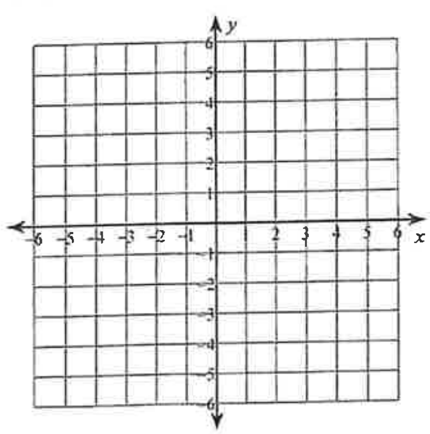
4) $y = \frac{4}{3}x - 4$



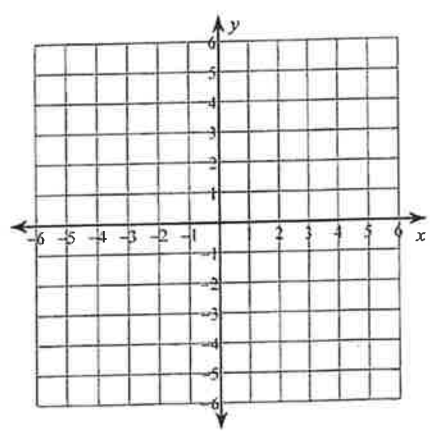
$m =$

$b =$

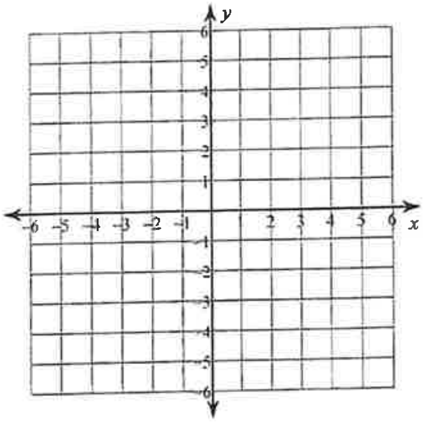
5) $y = -3x - 3$



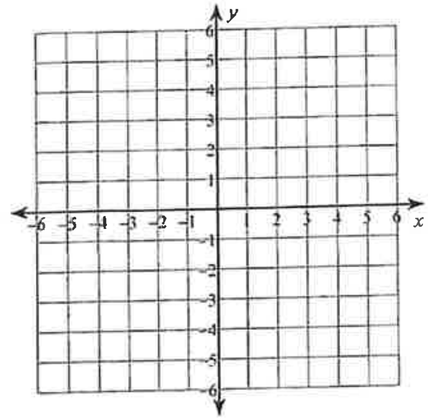
6) $y = 4$



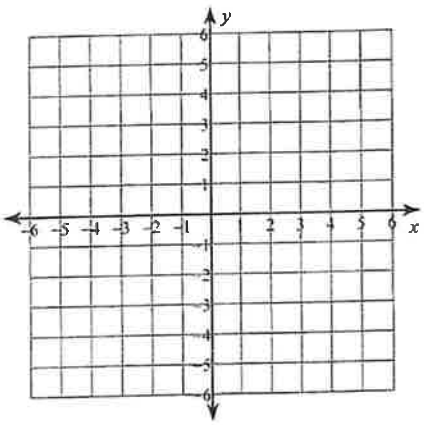
7) $y = \frac{3}{5}x - 1$



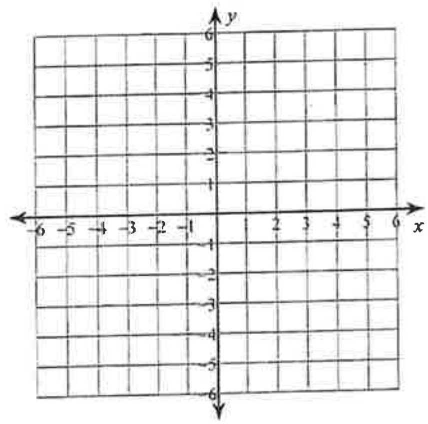
8) $x = 5$



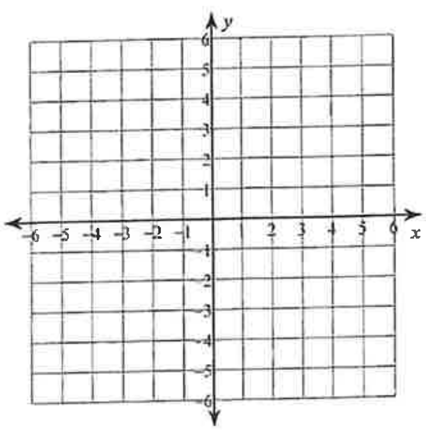
9) $y = 3$



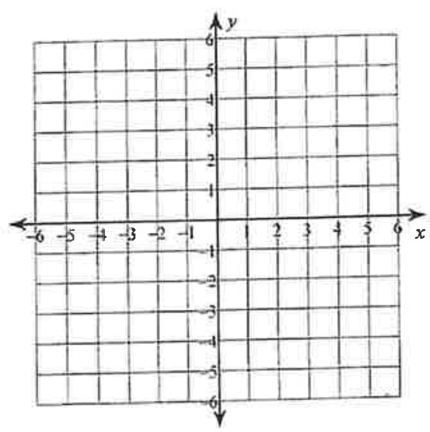
10) $y = 3x - 2$



11) $y = 4x + 3$



12) $y = \frac{6}{5}x + 5$



Slope Intercept Notes- MEMORIZE

Lines 3 types

1. $y = mx + b$, Diagonal
2. $y = \#$ (a number), horizontal
3. $x = \#$ (a number), vertical

1. $\mathbf{y = mx + b}$ is the equation of a line in slope intercept form (this is a diagonal line)

m = slope = $\dfrac{\text{“rise”}}{\text{run}} = \dfrac{\text{up or down}}{\text{over left or right}}$

For two points (x_1,y_1) and (x_2,y_2) to find the slope use the formula below:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

If m is +(positive) the line goes uphill, if m = - (negative) , the line from left to right goes downhill. Make sure your graph matches the sign of your slope.

b= the y intercept, where the line crosses the y axis, and where $x = 0$

b = (0, y)

Start to graph at the **y axis** at the **b**, or **y intercept** and then according to your slope graph your next point. Connect the y intercept point and your point and now you have a line.

2. **y= a number**, for example y = 3 is a **horiZontal line** that goes thru the point (0,3) with a SLOPE OF ZERO. m=0, b= 3 or (0,3).

If you have two points both with the same y value, for example (2, **4**) (3, **4**) the equation of your line is y = 4, m = 0 and b = (0,4).

3. **x= a number**, for example x = 2 is a **vertical line** that goes thru the point (2, 0) with an UNDEFINED SLOPE. m=U, b= NONE. DO NOT PUT ZERO YOU WILL BE WRONG. There is no y intercept as the line runs parallel to the y axis and never crosses it.

If you have two points both with the same x value, for example (2, 5) (2, 4) the equation of your line is x = 2, m = undefined and b = none.