Mr. Thurlwell's Supplement
Algebra 1

Unit 1: Linear Equations

Name:_____

| Assignment #1 (1.2) |
| pg 13 15-54(by 3s) 38,59 |

| Assignment #2 (1.6) |
| pg 43 13-23,32 |

| Assignment #3 (1.7) *** |
| pg 51 3-48(by 3s) |

| Assignment #4 (2.3) |
| pg 93 2-16e |

| Assignment #5 (2.3) |
| pg 93 23-39o, 42-52 |

| Assignment #6 (2.4) |
| pg 100 10-24 |

| Assignment #7 (2.4) |
| pg 100 25-36,41,42 |

| Assignment #8 (1.5)*** |
| pg 36 15-57(by 3s), 63b-d |

| Assignment #9 (2.8) |
| pg 129 8-17,37 |

***=quiz to follow

Learning Targets:

- I can evaluate a complex, multi-step numerical expressions. (order of operations including fractions, abs value, roots, exponents, parentheses) **(1.2)**
- I can identify the various ways to represent a relation. **(1.6)**
- I can identify domain and range for various representations of a relation. **(1.6)**
- I can determine if a relation is a function given any representation. **(1.7)**
- I can evaluate function notation. **(1.7)**
- I can identify the domain and range sets for any representation of a function. **(1.7)**
- I can solve a multi-step equation of one variable. **(2.3)**
- I can solve a multi-step equation with variables on both sides. **(2.4)**
- I can set up and solve a single variable application problem. **(2.3-2.4)**
- I can identify the type of solution for a one variable equation. **(1.5)**
- I can rewrite a formula in terms of one of its variables. **(2.8)**

1.2 Order of Operations

Define what it means when a problem says "simplify"

Think about how you would simplify $6^2 + 24 - (6) \div 3 \cdot 2$

To make sure that everyone does get the same value for a mathematical expression we have to follow certain rules of operations.

G
E R
M D
A S

Evaluate each expression.

1. $12 - 2 + 5 =$	2. $12 + 2 - 5 =$	3. $\sqrt{16} \cdot 4 \div 2 =$
4. $16 \div 4 \cdot 2 =$	5. $3 + 15 - 10 - 9 + 2 =$	6. $2^3 \cdot [5 - 7] =$
7. $-5 + 3^3 - 2 \cdot 7 =$	8. $2^2 - 2^3 + 5^2 =$	9. $8 \cdot 2 + 6 - 5 - 21 \div 3 =$
10. $10^3 \div 50 + 3 \cdot 8 =$	11. $12 - 8 \div 2^2 + 20 \div 5 =$	12. $100 \div 20 \div 5 =$
13. $25 - 12 + (8 - 2)3 =$	14. $1 - 2 - 3 - 4 - |-5| =$	15. $3 + 8 \cdot 4 - 12 \div 2 =$
16. $\dfrac{3 + 8 - 3 \cdot 3}{5^2 - 20 + 3} =$	17. $\dfrac{5 \cdot 6 \div 2 - 7}{10 - 3 \cdot 4 + 3} =$	18. $\dfrac{5 + 6 \cdot 7 - 3^2}{15 - 3 \cdot 6 + 2^3 - 3} =$

1.2 ORDER OF OPERATIONS (DAY 1) HOMEWORK

1) $20-5+6$

2) $20+5-6$

3) $32 \div 4 \cdot 2$

4) $32 \div 4 \div 2$

5) $\dfrac{22-8 \cdot 2}{5^2 - 23}$

6) $3+8 \cdot 3-5+6$

7) $10-3^2 + 24 \div 6$

8) $5^2 -3+21-5 \cdot 3$

9) $\dfrac{20-4^2 + 2 \cdot 3}{60 \div 2 \div 2}$

10) $3^2 \cdot 2^3 - 7 \cdot 10$

11) $10-15 \cdot 3+9$

12) $10 \cdot 15-3 \cdot 9$

13) $\dfrac{10^2 \div 25-3}{18-12+1}$

14) $4 \cdot 12-8+3-21 \div 3$

15) $1^5 + 2^4 - 3^3 + 4^2$

1.2 ORDER OF OPERATIONS (<u>DAY 2</u>) HOMEWORK

1) $12 \div 4 + 3^2$

2) $(4^2 + 5) - 3$

3) $20 \div (12 - 2) \bullet 3^2 - 2$

4) $10 + 3(2 + 6)$

5) $\dfrac{1}{2}\sqrt{16} + 5$

6) $(2)(9)^2 - 3(6 - 1) + 1$

7) $20 - (4)(2) + 3$

8) $2 + 3[5 + (4 - 1)^2]$

9) $\dfrac{15 - 8}{2 \bullet 3 + 1}$

10) $50 - 2(8 - 3)^2$

11) $100 - 10(2 + 3) + 4$

12) $\sqrt[3]{45 - 18} + 2^3$

13) $[2(9 - 5) + 1] \bullet 3^2$

14) $\dfrac{40 - 8}{27 - 5^2 + 2}$

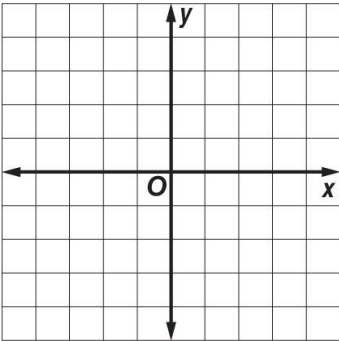15) $35 - 8 \bullet 3 + \sqrt{12 - 3}$

16) $-3^2 + 14 - 2(5)$

17) $\dfrac{24 - (-2)^2}{-8 + 3}$

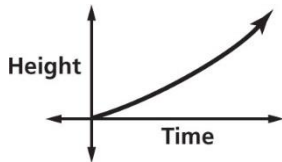18) $\left(\sqrt{9}\right)^2 - 4 \div 2$

1-6 Practice
Relations

1. Express {(4, 3), (−1, 4), (3, −2), (−2, 1)} as a table, a graph, and a mapping. Then determine the domain and range.
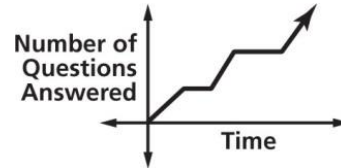
Describe what is happening in each graph.

2. The graph below represents the height of a tsunami as it travels across an ocean.

Height | Time
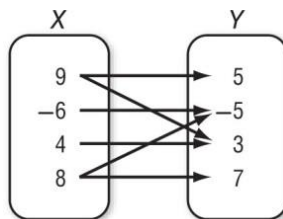
3. The graph below represents a student taking an exam.

Number of Questions Answered | Time

Express the relation shown in each table, mapping, or graph as a set of ordered pairs.

4.

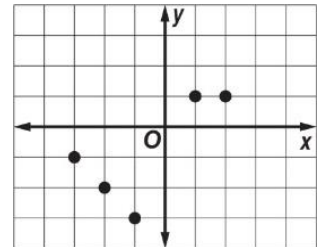| X	Y
0	9
−8	3
2	−6
1	4

5.

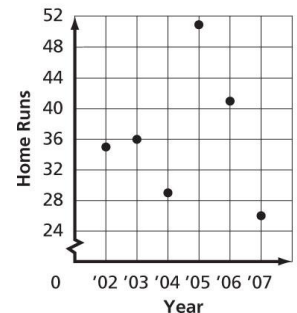| X	Y
9	5
−6	−5
4	3
8	7

6.

7. The graph shows the number of home runs hit by Andruw Jones of the Atlanta Braves. Express the relation as a set of ordered pairs. Then describe the domain and range

Andruw Jones' Home Runs

Home Runs | Year

5

1. TRANSPORTATION The cost of riding in a cab is $3.00 plus $0.75 per mile. The equation that represents this relation is $y = 0.75x + 3$, where x is the number of miles traveled and y is the cost of the trip. Look at the graph of the equation and determine whether the relation is a function.
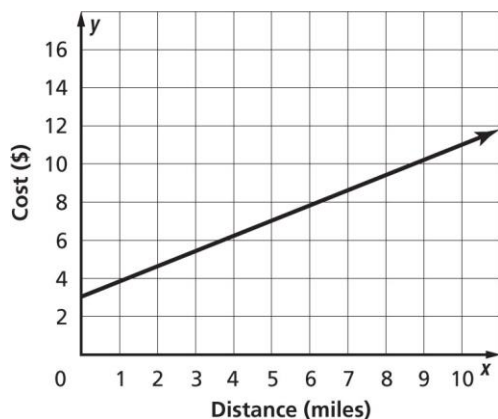

2. TEXT MESSAGING Many cell phones have a text messaging option in addition to regular cell phone service. The function for the monthly cost of text messaging service from Noline Wireless Company is $f(x) = 0.10x + 2$, where x is the number of text messages that are sent. Find $f(10)$ and $f(30)$, the cost of 10 text messages in a month and the cost of 30 text messages in a month.

3. GEOMETRY The area for any square is given by the function $y = x^2$, where x is the length of a side of the square and y is the area of the square. Write the equation in function notation and find the area of a square with a side length of 3.5 inches.

4. TRAVEL The cost for cars entering President George Bush Turnpike at Beltline road is given by the relation $x = 0.75$, where x is the dollar amount for entrance to the toll road and y is the number of passengers. Determine if this relation is a function. Explain.

5. CONSUMER CHOICES Aisha just received a $40 paycheck from her new job. She spends some of it buying music online and saves the rest in a bank account. Her savings is given by $f(x) = 40 - 1.25x$, where x is the number of songs she downloads at $1.25 per song.

a. Graph the function.
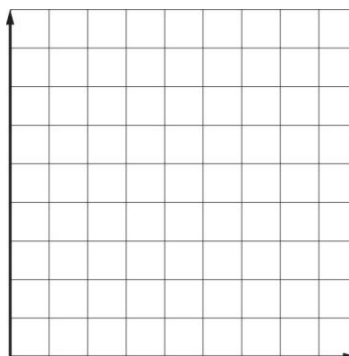
b. Find $f(3)$, $f(18)$, and $f(36)$. What do these values represent?

c. How many songs can Aisha buy if she wants to save $30?

For 6-10, complete the table below for each problem.

Representation	Input/Output table	Mapping	Graph	Ordered Pairs
6.				
7.				
8.				
9. $\{(1, 4), (2, -2), (3, -6), (-6, 3), (-3, 6)\}$				
10. $\{(6, -4), (2, -4), (-4, 2), (4, 6), (2, 6)\}$				

2.3 Warm-up

Solving 1-Step Equations

Can you find the value of the variable that makes the equation true?

1) $3x = 6$

2) $12 = \dfrac{p}{2}$

3) $x + 1 = 15$

4) $18 = m - 4$

5) $4 = 8h$

6) $j - 7 = 0$

7) $y + 1 = -3$

8) $.25 = \dfrac{1}{4}d$

How did <u>you</u> solve these problems?

Develop a word problem that models #4?

Think about the following:

Mt. Whitney is the highest point in the contiguous United States at 14,494 feet. This is 5826 feet less than Mt. McKinley in Alaska. How high is Mt. McKinley?

Draw a picture that would model this problem. Create an equation that represents the picture and solve it. Does this answer make sense?

What are some rules to generalize solving 1-step equations?

2.1-2.3 Practice & Review

For problems 1-12, translate each sentence into an equation.   Then solve the equation.

1) A number plus 6 is 5.

2) The sum of 8 and a number is 9.

3) 3 more than a number is less than 10.

4) A number plus 7 is greater than or equal to 15.

5) 11 minus a number is 5.

6) The quotient of 25 and a number is 5.

7) A number divided by 13 is less than or equal to 2.

8) One third of a number is greater than 1.

9) 6 divided by a number is 3.

10) 2 less than a number is 2.

11) The difference between 9 and a number.

12) Katie is twice as old as her sister Mara. The sum of their ages is 24. Write a one-variable equation to represent the situation. Then solve it.

Consider the following problems and their answers. How do you develop the process to arrive at the solution?

13) $2x - 8 = 4$; $x = 6$

14) $11 = 3 + \dfrac{1}{2}k$; $k = 16$

15) $\dfrac{z}{7} - (-8) = 9$; $z = 7$

16) $5(y + 1) = 10$

17) A graph has a domain of -2, 2, 5, 8 & and output of 1. Map it. Evaluate where it is a function and why.

18) Katie is twice as old as her sister Mara. The sum of their ages is 24. Write a one-variable equation to represent the situation.

19) Find $f(1.5)$. $f(x) = -\dfrac{4}{3}x + 2$

2.4-Geology Rock Equations

Mr. Anderson is a geologist and has a laboratory full of rocks. He knows that each rock weighs exactly one pound (+1), and he would like to figure out how many rocks are in each crate. To figure that out without opening the crates, Mr. Anderson places crates and rocks on a scale until they are balanced. Using his math skills, he is able to reason how many rocks are in each crate without having to look inside.

1. The following picture represents the first set of crates and rocks Mr. Anderson put on the balance. How many rocks are inside each crate?
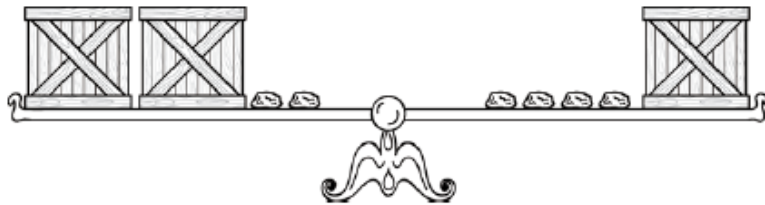
Mr. Anderson has made several picture representations on his clipboard of other combinations of crates and rocks that balanced. Can you figure out how many rocks are in each set of crates?

2.
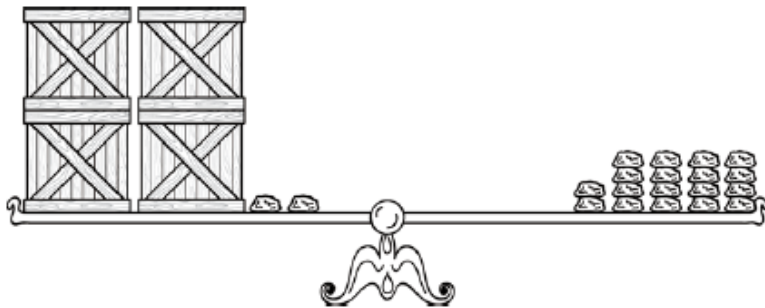
3.
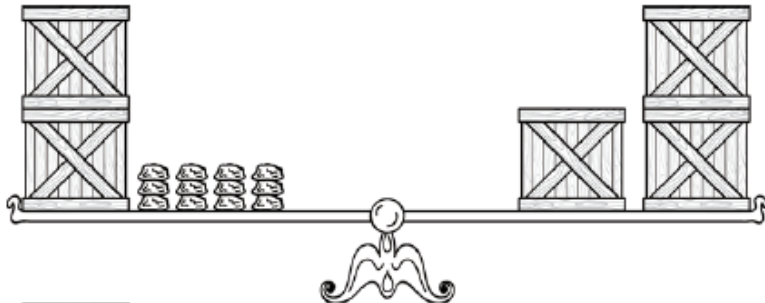
4.
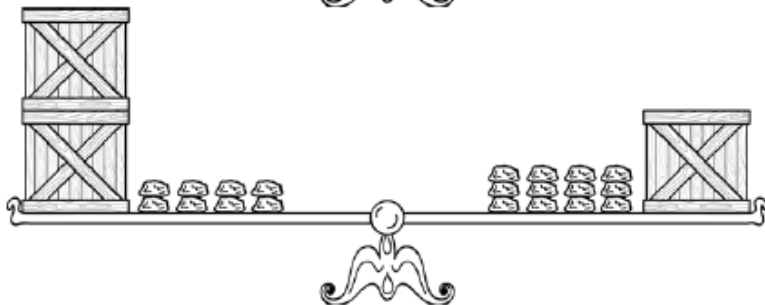
5.
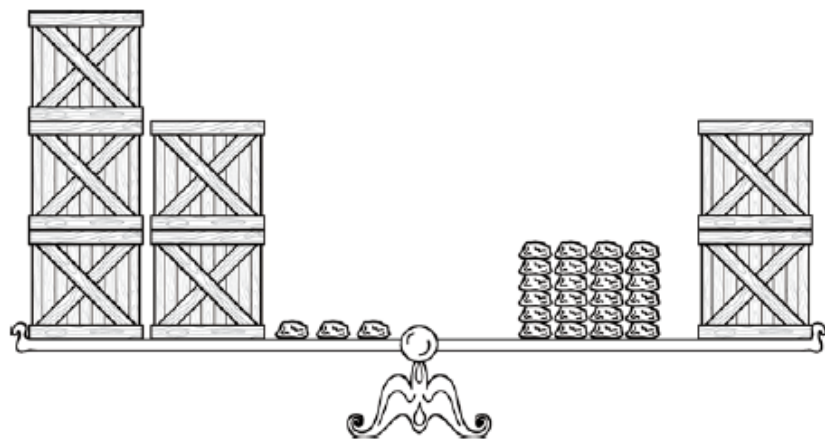
Mr. Anderson wrote down the following equations, but did not draw any pictures. Can you find the value of x in each? (**Hint:** Think of each x as a crate of rocks.)

6. $7x = 6 + 5x$

7. $30 = 4x + 6$

8. $2(x + 4) = 16$

9. $7 + 5x = 3x + 13$

6

1) Two cars travel the same distance. The first car travels at a rate of 40 miles per hour and reaches its destination in t hours. The second car travels at a rate of 55 miles per hour and reaches its destination 3 hours earlier than the first car. How long does it take for the first car to reach its destination?

$$\boxed{\text{Rate of car 1}} \cdot \boxed{\text{Time for car 1}} = \boxed{\text{Rate of car 2}} \cdot \boxed{\text{Time for car 2}}$$

2) A health club charges nonmembers $2 per day to swim and $5 per day for aerobics classes. Members pay a yearly fee of $200 plus $3 per day for aerobics classes. Write and solve an equation to find the number of days you must use the club to justify a yearly membership.

3) $\dfrac{5+y}{3} - 7 = 53$

4) $-12x + 8 + 5x = 14$

5) $4m - 3 + 12 - 6m = -10m + 1 + 8m$

6) Forty-six times a number 'n' is subtracted by two times the quantity of the product of three times 'n' minus 15. This value is equivalent to sixty. Translate this into mathematical symbols and solve.

7) Victor has $60 in savings. He plans to save $45 a month from money he earns baby-sitting. In how many months will his savings be $600?

8) Given the problem $-2 = \dfrac{7}{5}x + 5$, we've discussed several different ways to approach it. Below are three. Solve all three to verify the method works. Then, select which way you like and explain why.

a)

$-2 = \dfrac{7}{5}x + 5$

$-7 = \dfrac{7}{5}x$

$\left(\dfrac{5}{7}\right)(-7) = \left(\dfrac{5}{7}\right)\dfrac{7}{5}x$

b)

$-2 = \dfrac{7}{5}x + 5$

$-7 = \dfrac{7}{5}x$

$(5)(-7) = (5)\dfrac{7}{5}x$

$-35 = 7x$

$\dfrac{-35}{7} = \dfrac{7x}{7}$

c)

$-2 = \dfrac{7}{5}x + 5$

$-7 = \dfrac{7}{5}x$

$\dfrac{-7}{\dfrac{7}{5}} = \dfrac{\dfrac{7}{5}x}{\dfrac{7}{5}}$

9) The problem $-10(t + 2) = 30$ can be solved multiple ways. One method is in two steps. See if you can come up with that approach and another.

2.8- Rewriting Formulas

Rewrite the given formula for the indicated variable. Then, match the formula to its denotation using the table on the right. You may need to do your work on the back.

1) $d = rt$, **solve for r**

2) $I = \Pr t$, **solve for P**

1._____ 1._____

2. _____ 2._____

3) $F = \dfrac{9}{5}C + 32$, **solve for C**

4) $A = \dfrac{1}{2}bh$, **solve for b**

3. _____ 3._____

4. _____ 4._____

5) $A = lw$, **solve for l**

6) $P = 2l + 2w$, **solve for w**

5. _____ 5._____

6. _____ 6._____

7) $A = \dfrac{1}{2}(b_1 + b_2)h$ **solve for** b_2

8) $A = \pi r^2$, **solve for r**

7. _____ 7._____

8. _____ 8._____

9) $C = 2\pi r$, **solve for r**

9. _____ 9._____

9

What do they mean?
a) Formula to convert Celsius to Fahrenheit.
b) Find your distance by how fast you traveled and the time you spent.
c) Find the circumference of a circle.
d) Find the area of a triangle.
e) Find the area of a trapezoid.
f) Find the perimeter of a rectangle.
g) Find out how much interest accrued.
h) Find the area of a rectangle.
i) Find the area of a circle.

____**1.** Which of the following isn't similar to output?

A y-values   **C** Both A & B

B Domain   **D** range

____**2.** Find the solution of $x + 4 = 7$ if the replacement set is $\{1, 2, 3, 4, 5\}$.

A 1   **B** 3   **C** 4   **D** 2

____**3.** A car rental company charges a rental fee of $20 per day in addition to a charge of $0.30 per mile driven. How much does it cost to rent a car for a day and drive it 25 miles?

F $45.30   **G** $20.30   **H** $27.50   **J** $26.00

____**4.** Which statement best describes the graph of the price of one share of a company's stock shown below?

A The price increased more in the morning than in the afternoon.

B The price decreased more in the morning than in the afternoon.

C The price increased more in the afternoon than in the morning.

D The price decreased more in the afternoon than in the morning.
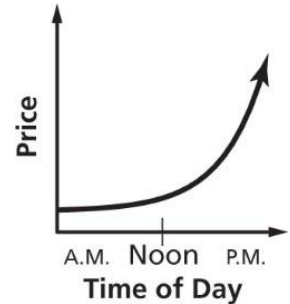
____**5.** What is the domain of the relation?

F $\{-1, 0, 1, 3\}$ **H** $\{-2, -1, 0, 1, 2, 3\}$

G $\{-2, 0, 1, 3\}$ **J** $\{0, 1, 2, 3\}$
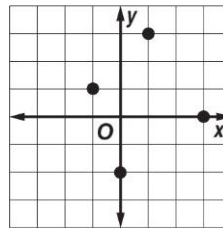
____**6.** Determine which relation is a function.

A
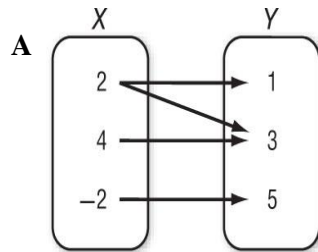
B

x	3	4	4	5
y	− 1	2	3	4

C $y = \frac{1}{5}x + 2$ **D** $\{(3, 0), (-2, -2), (7, -2), (-2, 0)\}$

____**7.** If $h(r) = \frac{2}{3}r - 6$, what is the value of $h(-9)$?

F 12   **G** 0   **H** $-6\frac{2}{3}$ **J** −12

For Questions 8 and 9, use the graph.
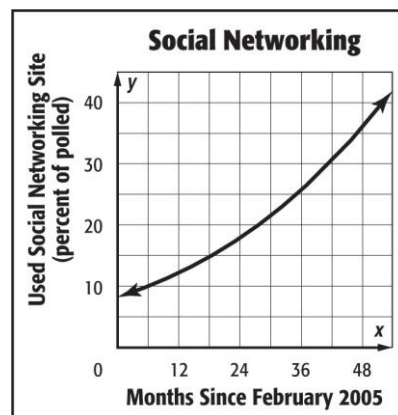
_____**8.** Interpret the *y*-intercept of the graph.

A All those polled used a social networking site 8 months after February 2005.

B About 8% of those polled used a social networking site in February 2005.

C No one used a social networking site in February 2005.

D There were 8 social networking sites in February 2005.

Social Networking

_____**9.** Interpret the end behavior of the function in terms of social networking.
F expected to decrease   **H** expected to level off at 55%
G expected to increase   **J** expected to level off at 8%

10. Write an equation from the sentence and solve using mental math: The sum of the square of a number and 5 is 36.

11. Evaluate $2^3[(15 - 7)(4 \div 2)]$.

12. Solve $\dfrac{m+2}{5} - 7 = 1$

_____**13.** Translate the following sentence into an equation.
Twice a number m minus three equals the sum of m and five.

A $2(m - 3) = m + 5$

B $2m - 3 = m + 5$

C $2m - 3 = 5m$

D $2(m - 3) = 5m$

_____**14.** Solve $\dfrac{3}{5}x = 15$.

A 9   **B** 5   **C** 25   **D** 75

_____**15.** Evaluate $|2b - 5| + 1$ if $b = 1$.

F –2   **G** 2   **H** 4   **J** –8

_____**16.** Solve $5(g - 2) + g = 6(g - 4)$.

F all numbers   **G** 0   **H** 2   **J** Ø

11

_____**17.** Solve $ax - 5 = b$ for a.

A $x(b + 5)$ **B** $\dfrac{b - 5}{x}$ **C** $\dfrac{b + 5}{x}$ **D** $x(b - 5)$

_____**18.** In Death Valley, California, the highest ground temperature recorded was 94°C on July 15, 1972. In the formula $C = \dfrac{5}{9}(F - 32)$, C represents the temperature in degrees Celsius and F represents the temperature in degrees Fahrenheit. To the nearest degree, what is the highest ground temperature in Death Valley in Fahrenheit?

F 201°F **G** 84°F **H** 34°F **J** 137°F

19. A container company wants to make a cylindrical can with a volume of 1188 cubic inches. The formula $V = \pi r^2 h$ represents the volume of a cylinder. In this formula, V represents the volume, r represents the radius of the cylinder's base, and h represents the height of the cylinder. Solve for h. What height should the company make the can if the radius of the base must be 6 inches?

20. Translate the following equation into a verbal sentence. $3(x + y) = 2y - x$

21. Deluxe Cleaners charges $20 to dry clean a suit. They pay an employee $8 per hour to clean the suit and use $4 worth of dry cleaning fluid on each suit. The profit for this service can be determined using the equation below:

$$p = x\,[20 - (4 + 8h)]$$

a) Determine which each variable represents.

b) Which expression shows the amount of profit earned when 15 suits are dry-cleaned?

i) $16 - 8h$ ii) $24 - 8h$ iii) $240 - 8h$ iv) $240 - 120h$

c) Determine the profit if an employee took 1 hour to dry-clean 10 suits.

12

Questions I have regarding…..
The main focus of this section is…..

1.2 Order of Operations

1.6 Relations

1.7 Functions

2.3 Solving Multi-Step Equations

2.4 Solving Equations with Variables on Each Side

2.8 Literal Equations

Multi-step Equations EXTRA PRACTICE

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

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

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

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

3._____

4._____

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

6) $29 = r + 5 + 8r$

5._____

6._____

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

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

7._____

8._____

9) $21 = 29m + 13m$

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

9._____

10._____

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

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

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

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

15) $4(-x + 4) = -6$

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

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

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

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

20) $-4n - 8(1 + 7n) = 8$

21) 8(4k − 4) = −5k − 32

22) −8(−8x − 6) = −6x − 22

23) 8(1 + 5x) + 5 = 20 + 5x

24) −11 − 5a = 6(5a + 4)

25) −5(4x − 2) = −2(3 + 6x)

26) 5(2x + 6) = −4(−5 − 2x) + 3x

27) $12 = \dfrac{x}{6} + 1$

28) $-\left|-3\right| + 2x - 8 = 5x + 2$

29) 4 - (v + 8) = 9v

30) $-5 = -\dfrac{2}{3}x + 10$

21_____

22._____

23._____

24._____

25._____

26._____

27._____

28._____

29._____

30._____

16

Cornell Notes Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) **Topic:**_____ _____	**Name:** _____ **Class:** _____ **Period:** _____ **Date:** _____

Essential Question:

Questions/Main Ideas:	**Notes:**

Summary:

Cornell Notes
Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.)

Topic:_____

_____

Name: _____

Class: _____ **Period:** _____

Date: _____

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Questions/Main Ideas:	**Notes:**

Summary:

Cornell Notes

Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.)

Topic:_____

_____

Name: _____

Class: _____ Period: _____

Date: _____

Essential Question:

Questions/Main Ideas:	Notes:

Summary:

Cornell Notes Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) Topic:_____ _____	Name: _____ Class: _____ Period: _____ Date: _____

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Add on problems or addition examples:

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