Summer Work
Rising Pre-Algebra Students

Directions: Read through the first seven pages for helpful tips. The following work is broken up into weeks to help you complete it over the summer.

Sample Activity

A Crypto Mind Bender® problem gives two or more mathematical truths and asks you to match each letter to a number to solve the cryptogram and discover the classic joke. Finding the answers is easier with a chart; a charting method is presented for your convenience (use of the chart is optional). Always mark <u>all</u> the true and false ("+" and "-") information provided by each clue on the chart.

$w > d$

$w < m$

$h > m$

	m	w	h	d
1				
2				
3				
4				

m = ____

w = ____

h = ____

d = ____

$r + u + t = 20$

$u > t > r$

	b	t	u	r
5				
6				
7				
8				

b = ____

t = ____

u = ____

r = ____

Cryptogram (Parentheses separate double digits; they have no other meaning.)

24y 1o 4833ing6i51s 483?
74ey 1on'7 kno2 74e 2o51s!

_ _y _ o _ _ _ _ ing _ i _ _ s _ _ _?
_ _ ey _ on' _ kno _ _ _ e _ o _ _ s!

Since *h* is greater than *m*, and *m* is greater than *w*, and *w* is greater than *d* ($h > m > w > d$), *h* must be 4, the largest number in the group. Mark the chart with "+" for true, and "–" for false as shown. Since *m* is less than *h*, but greater than *w* and *d*, *m* must be 3. Mark the chart with "+" for true, and "–" for false as shown.

	m	w	h	d
1	–		–	
2	–		–	
3	+	–	–	–
4	–	–	+	–

Important: Always mark all the true and false (+ and –) information provided by each clue on the chart. The most common mistake students make is not marking the false answers on the chart. By looking at the chart we know that *w* and *d* must be either 1 or 2, and since *d* is less than *w*, *d* must be 1, and *w* must be 2.

If *r* plus *u* plus *t* equals 20, *r*, *u*, and *t* must be 5, 7, or 8 for the equation to be true. Therefore, *r*, *u*, and *t* are not 6. Mark the chart with "–" for false as shown. Looking at the chart we know that *b* must be 6. Mark the chart with "+" for true as shown.

	b	t	u	r
5				
6	+	–	–	–
7				
8				

Since *u* is greater than *t*, and *t* is greater than *r*, and only numbers 5, 7, and 8 remain, then *u* must be 8, the largest number, *t* must be 7, the middle number, and *r* must be 5, the smallest number. Mark these final answers on the chart.

	b	t	u	r
5	–	–	–	+
6	+	–	–	–
7	–	+	–	–
8	–	–	+	–

Using the answers from the clues, substitute the numbers with their corresponding letters to uncover the hidden classic joke.

Why do hummingbirds hum?
They don't know the words!

Sample Analogies

Here is an example of an analogy.

finger : hand :: toe : foot

The analogy reads "finger is to hand as toe is to foot." This means the relationship between finger and hand is analogous to the relationship between toe and foot.

Let us try a few sample math analogies.

Sample Analogy 1

$$\frac{2}{7} : \frac{6}{21} :: \frac{5}{8} : ?$$

Answer to Sample Analogy 1

$$\frac{2}{7} : \frac{6}{21} :: \frac{5}{8} : \frac{15}{24}$$

triple the numerator and denominator | **triple the numerator and denominator**

Sample Analogy 2

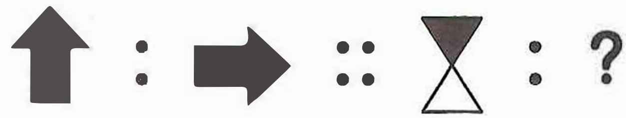
6 grapefruits : \$3.00 :: 4 grapefruits : ?

Answer to Sample Analogy 2

6 grapefruits : \$3.00 :: 4 grapefruits : \$2.00

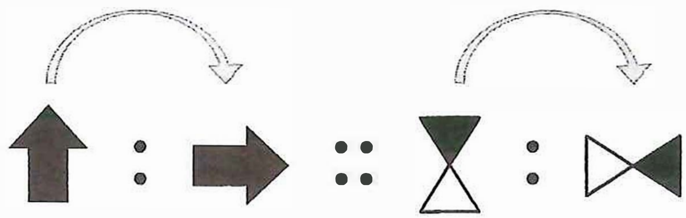
If 6 grapefruits cost \$3.00, then 2/3 as many grapefruits (4 grapefruits) costs 2/3 as much (\$2.00).

Sample Analogy 3



Answer to Sample Analogy 3

90° clockwise rotation 90° clockwise rotation



Sample Analogy 4

dad is 70 inches tall : dad is 5 feet, 10 inches tall :: son is 53 inches tall :

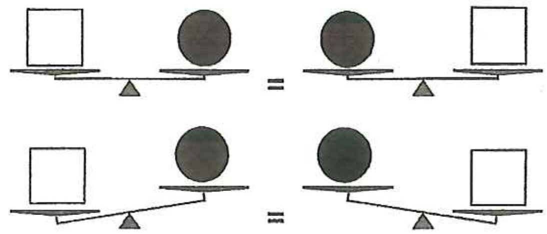
Answer to Sample Analogy 4

dad is 70 inches tall : dad is 5 feet, 10 inches tall :: son is 53 inches tall : son is 4 feet, 5 inches tall

convert to feet and inches convert to feet and inches

Balance Tips
(Algebra Concepts)

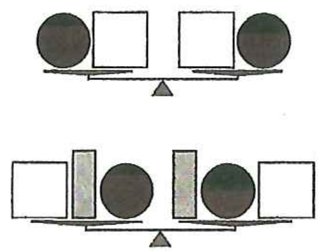
1. Reversing the pans does not change the balance of the scale. For example:



If $a = b$ then $b = a$
If $a > b$ then $b < a$

Symmetric Property of Equality and Inequality

2. Rearranging "weights" does not change the balance of the scale. For example:



$a + b = b + a$
If $a + b < c$ then $b + a < c$
If $a + b > c$ then $b + a > c$

Commutative Property of Equality and Inequality

$a + (b + c) = (a + b) + c$

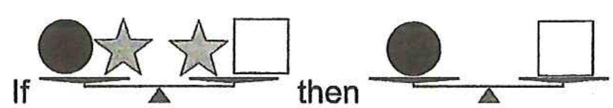
Associative Property of Equality and Inequality

3. Adding the same "weight" to each pan does not change the balance of the scale. For example:

If $a = b$ then $a + c = b + c$
If $a < b$ then $a + c < b + c$
If $a > b$ then $a + c > b + c$

Addition Property of Equality and Inequality

4. Subtracting the same "weight" from each pan does not change the balance of the scale. For example:



If $a = b$ then $a - c = b - c$
If $a < b$ then $a - c < b - c$
If $a > b$ then $a - c > b - c$

Subtraction Property of Equality and Inequality

5. Multiplying both pans equally (e.g. doubling) does not change the balance of the scale. For example:

If $a = b$ then $a \bullet c = b \bullet c$
If $a < b$ then $a \bullet c < b \bullet c$
If $a > b$ then $a \bullet c > b \bullet c$

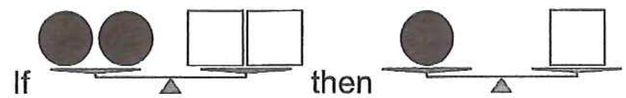
Multiplication Property of Equality and Inequality

BALANCE TIPS (Cont.)
(ALGEBRA CONCEPTS)

6. Dividing or partitioning both pans into equally numbered groups (e.g. take half) does not change the balance of the scale. For example:

   If $a = b$ then $a/c = b/c$
   If $a < b$ then $a/c < b/c$
   If $a > b$ then $a/c > b/c$

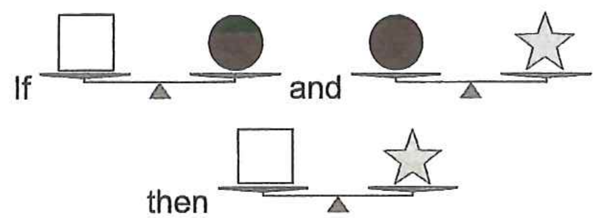
   Division Property of Equality and Inequality



7. Substitute one "weight" for a similar "weight" or group of "weights". For example:

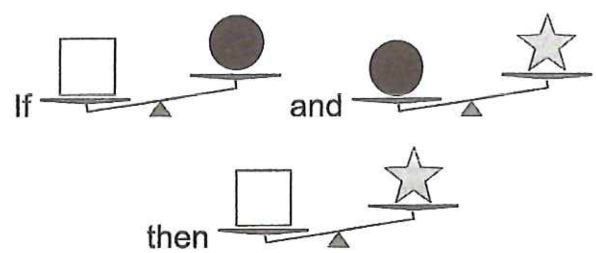
   If $a = b$ then "a" can be substituted for "b" in any equation or inequality.

   Substitution Property of Equality and Inequality



   If $a = b$ and $b = c$ then $a = c$
   If $a < b$ and $b < c$ then $a < c$
   If $a > b$ and $b > c$ then $a > c$

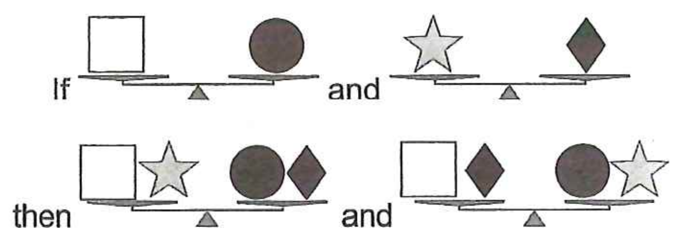
   Transitive Property of Equality and Inequality



8. Combining two balanced scales does not change the balance of the new scale. For example:

   If $a = b$ and $c = d$ then $a + c = b + d$ and $a + d = b + c$

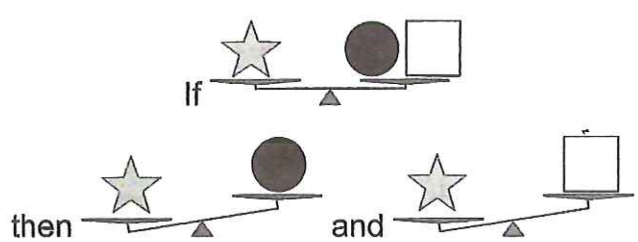
   Addition and Substitution Properties



9. Removing a "weight" from one pan of a balanced scale causes an imbalance. For example:

   If $a + b = c$ then $c > a$ and $c > b$

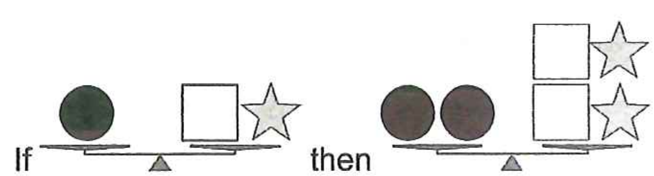
   Equation to Inequality or Trichotomy Property



10. When multiplying or dividing, be sure to do the same to all "weights" in the pans. For example:

   $a \cdot (b + c) = (a \cdot b) + (a \cdot c)$

   Distributive Property



Tips for Solving Equations

Everything you need to know to solve the equations in this packet, you have already learned. The way to solve them is to think about what you know and apply that knowledge.

One-Step Equations

- What are you doing to the variable? Undo it using inverse operations.

$4x = 12$	The variable is being multiplied by 4.
$\frac{4x}{4} = \frac{12}{4}$	Undo it by dividing both sides by 4.
$x = 3$	The solution is 3.

Two-Step Equations

- Circle the variable term.
- What is happening outside the circle? Undo it using inverse operations.
- What is happening to the variable? Undo it using inverse operations.

$4x + 6 = 18$	Circle the variable term.
$4x + 6 = 18$ $\quad -6 \quad -6$	Outside the circle, you are adding 6. Undo it by subtracting 6 from both sides.
$4x = 12$	The variable is being multiplied by 4.
$\frac{4x}{4} = \frac{12}{4}$	Undo it by dividing both sides by 4.
$x = 3$	The solution is 3.

Multi-Step Equations

- Start by simplifying each side.
  - Use distributive property if there is an expression in parentheses.
  - Combine any like terms.
  - Follow order of operations.
- One both sides are simplified, follow the directions for a two-step equation.

$2(2x + 3) = x + 10 - x + 8$	Start by simplifying each side.
$4x + 6 = x + 10 - x + 8$	Use the distributive property on the left-hand side.
$4x + 6 = 18$	Combine the like terms on the right-hand side.
$4x + 6 = 18$	Solve the two-step problem.

Week #1

Choose the letter of the best words to describe these sets of numbers.

______ 1. {0, 2, 4, 6, 8, . . . }	a. odd numbers
______ 2. { 0, 1, 2, 3, 4, 5, . . . }	b. integer numbers
______ 3. {1, 3, 5, 7, 9, . . . }	c. whole numbers
______ 4. {. . ., -3, -2, -1, 0, 1, 2, . . . }	d. perfect square numbers
______ 5. {1, 4, 9, 16, 25, 36, . . . }	e. even numbers

Write the prime factorization of each number.

6. 125

7. 72

8. 92

9. 960

True or False?

______ 10. 1 is a prime number

______ 11. 2 is a prime number

______ 12. 0 is an even number

Are these numbers prime? If not, list two numbers that divide the number evenly. (Use the divisibility rules to help you!)

13. 75

14. 91

15. 97

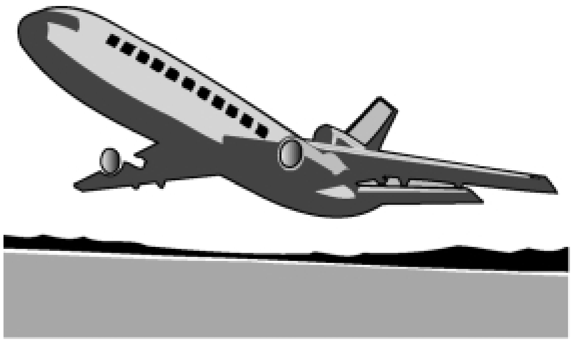
16. 111

17. 120

NAME ______________________________________ DATE _____________ PERIOD _____

1-7 Real-Life Career Activity

Airline Ticket Agent



Airline ticket agents make sure that passengers are on the correct flight. If a flight is canceled or delayed, they help passengers find different flights that will get them to their destination. Ticket agents also check that each passenger's baggage is the right size and weight to be loaded onto the airplane. Bags that are too large or too heavy cannot be taken on the plane. A plane that is too heavy will not be able to fly correctly. Ticket agents for one airline use the formula below to check that baggage is the correct size.

$$H + W + L = 62 \text{ inches}$$

In this formula, H is the height of the bag, W is the width of the bag, and L is the length of the bag.

Suppose a passenger has a bag 26 inches high and 16 inches wide. What length L can the bag be?

$$\begin{aligned} H + W + L &= 62 && \textit{The sum is 62.} \\ 26 + 16 + L &= 62 && \textit{Replace H with 26 and W with 16.} \\ 42 + L &= 62 && \textit{Add.} \\ L &= 20 && \textit{Solve for L.} \end{aligned}$$

The bag can be 20 inches long.

Solve.

1. A passenger has a bag 5 inches high and 10 inches wide. What length can the bag be?

2. A passenger has a bag 35 inches long and 20 inches wide. What height can the bag be?

3. A passenger has a bag 50 inches long and 20 inches wide. Will the ticket agent send the bag to be loaded on the plane?

Activity 5

Use the clues and the chart to determine the value of each letter, solve the cryptogram, and discover the classic joke.

$g > 7$
$g < a - i$

	g	i	c	a
1				
2				
8				
10				

g = ____
i = ____
c = ____
a = ____

$n \neq 9$
$d \neq 9$
$d < h < r$
$r \neq 11$

	h	d	r	n
6				
9				
11				
12				

h = ____
d = ____
r = ____
n = ____

$o > f > l$
$o \neq f + l$

	o	f	t	l
3				
4				
5				
7				

o = ____
f = ____
t = ____
l = ____

Cryptogram (Parentheses separate double digits; they have no other meaning.)

W9(10)7 616 79e 7(12)(10)4412 31897 s(10)y 75 79e 2(10)(12)? 65(11)'7 355k, 1'm 29(10)(11)81(11)8!

W _ _ _   _ _ _   _ _ e   _ _ _ _ _ _ _   _ _ _ _ _
s _ y   _ _   _ _ e   _ _ _?   _ _ _'_   _ _ _ k,
_'m   _ _ _ _ _ _ _ _!

Week #2

1. $9 + (-10)$

2. $10 - 12$

3. $-18 - 20$

4. $0 - 13$

5. $-10 + 3 + (-12)$

6. $-(-23)$

14. $(-2)^3$

15. $(-2)^4$

16. $(-6)(0)$

17. $\frac{0}{-12}$

18. $34 \div 0$

19. $-94 \div (-47)$

7. $|-9|$

20. $-7 \cdot (-13) \cdot 1{,}000$

8. $|9|$

21. $(-12)^2$

9. $6 \cdot 13$

22. $(-13)^2$

10. $-6 \cdot (-13)$

23. $|0|$

11. $72 \div (-18)$

24. $-2 \cdot (-26)$

12. $-72 \div (-18)$

25. 10^6

13. $-2 \cdot 49 \cdot 10$

26. $(-1)^{20}$

Complete Each Math Analogy

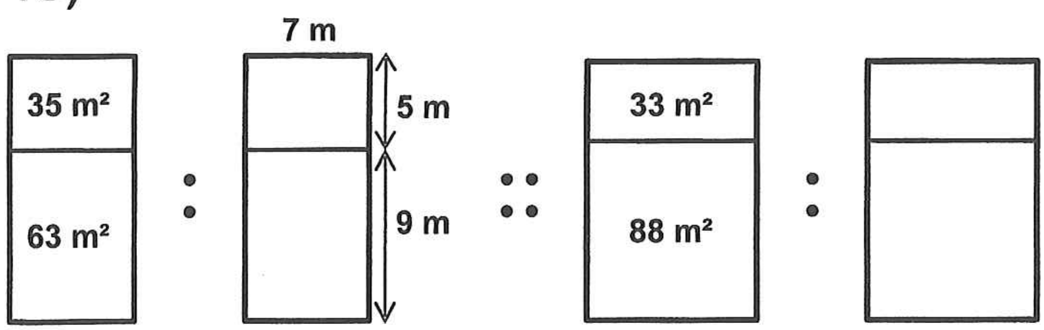
13)

40% of 17 : approximately 7 :: 30% of 13 :

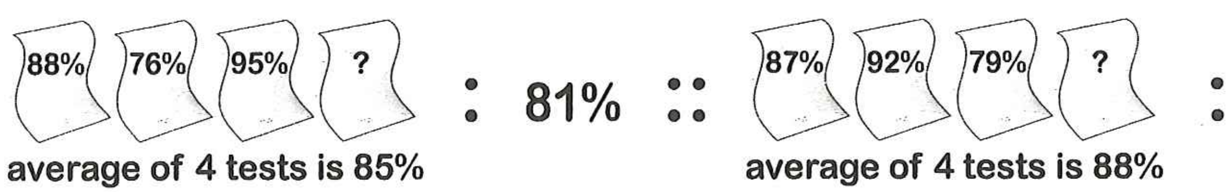
14)

4 yards in 2 seconds : 6 feet/second :: 20 yards in 5 seconds :

15)



16)



Week #3

1. $-\frac{4}{5}+\frac{1}{5}$

2. $-\frac{3}{8}+\left(-\frac{2}{8}\right)$

3. $5+\left(-3\frac{1}{4}\right)$

4. $-6.5+(-8.5)$

5. $-9+.08$

8. $(6.5)(-.03)$

9. $-\frac{3}{5}\cdot\left(-3\frac{1}{3}\right)$

10. $-4\frac{1}{8}\div\left(-\frac{33}{8}\right)$

11. $-60\div(-.03)$

12. $(-4.5)^2$

6. $-8\frac{3}{4}+\left(-7\frac{1}{8}\right)$

13. $(5-8^2)+(5-8)^2$

7. $3\frac{6}{7}-4\frac{1}{7}$

14. $\frac{-3\frac{1}{5}\cdot\frac{5}{4}}{2-3}$

15. Which of the following expressions simplifies to 2?

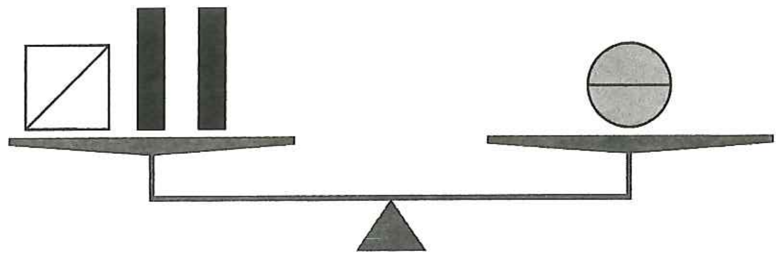
a. $-3+2\div 2$

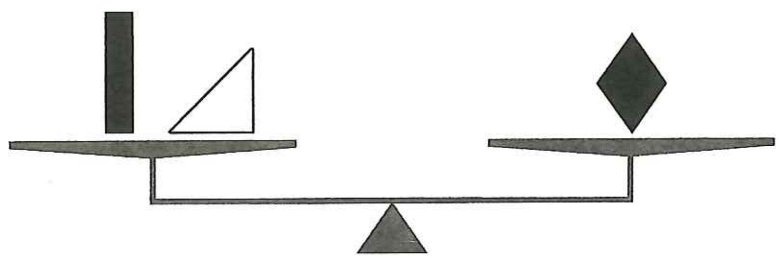
c. $6+6\div 6$

b. $9\div 9+2$

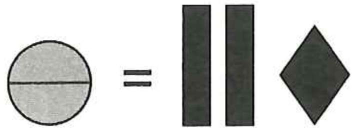
d. $8-9+3$

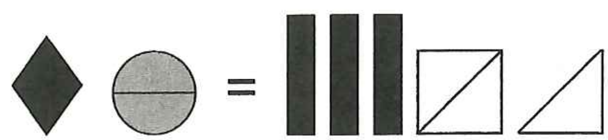
Balance Benders™

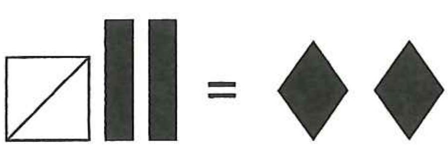


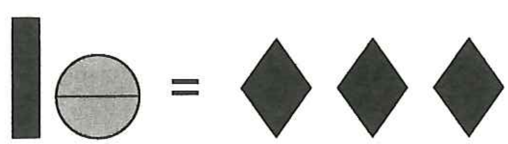


Circle the three answers below that will always be true.

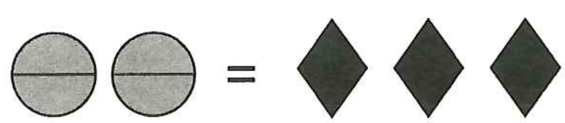
a. 

d. 

b. 

e. 

c. 

f. 

Week #4

1. Complete the chart.

Fraction	Decimal	Percent
$\frac{3}{20}$		
		8%
	3.96	
$\frac{7}{8}$		
		140%

Use the following information to find the ratios below: *DeWitt Middle School 8th grade has 14 girls, 22 boys, and 6 teachers.*

2. What is the ratio of boys to girls?

3. What is the ratio of girls to boys?

4. What is the ratio of teachers to students?

5. What is the ratio of teachers to girls?

6. DeWitt Middle School's principal wants to keep the same ratio of teachers to students for the entire school. If the school has 180 students, how many teachers should there be? Show your work.

Do these fractions terminate or repeat when changed to a decimal?

7. $\frac{3}{75}$

8. $\frac{11}{77}$

9. $\frac{1}{28}$

10. $\frac{7}{42}$

11. $\frac{8}{200}$

12. Jim drove 200 miles and used up 5.5 gallons of gas. Write this as a rate. Then write it as a unit rate.

Solve for the missing number.

13. $\frac{1}{8} = \frac{n}{100}$

15. $\frac{18}{24} = \frac{n}{99}$

14. $\frac{8}{20} = \frac{2}{n}$

16. $\frac{2.5}{15} = \frac{n}{125}$

Activity 6

Use the clues and the chart to determine the value of each letter, solve the cryptogram, and discover the classic joke.

$b = a + 2$
$r > 9$
$b < 7$

	b	a	r	h
4				
6				
8				
10				

b = ____
a = ____
r = ____
h = ____

$k \times 4 = 28$
$o + d = w$
$o > d$

	k	o	w	d
2				
3				
5				
7				

k = ____
o = ____
w = ____
d = ____

$s \times c = c$
$s + i = e$

	s	i	c	e
1				
9				
11				
12				

s = ____
i = ____
c = ____
e = ____

Cryptogram (Parentheses separate double digits; they have no other meaning.)

58y 2(11)2 t8(12) 63y (12)4t 8(11)1 83m(12)53(10)7?
6(12)94u1(12) 8(11)1 t(12)498(12)(10) 14(11)2 (11)t 541
4 p(11)(12)9(12) 3f 947(12)!

_ _ y _ _ _ t _ _ _ _ y _ _ t _ _ _
_ _ m _ _ _ _ _ _? _ _ _ _ _ u _ _ _ _ _ t _ _ _ _ _ _ _
_ _ _ _ _ _ t _ _ _ _ p _ _ _ _ _ _ f _ _ _ _ _!

Week #5

1. Which of the following is the same as the expression -4 times n?

   a. $-4n$ b. $(-4)(n)$ c. $-4 \cdot n$ d. all of these

2. Which of the following is the same as -3^2?

   a. 6 b. -9 c. 9 d. -6

3. If $a = -3$ and $b = 5$ then $2a + 4b$ simplifies to

   a. 14 b. -14 c. 26 d. 3

4. Which of the following is undefined?

   a. $5 \div (-5)$ b. $0 \div 5$ c. $5 \div 0$ d. none of these

5. In the expression $\frac{3}{n-4}$, which value for n would make the expression undefined?

   a. $n = 0$ b. $n = -4$ c. $n = 4$ d. $n = -3$

6. If $x = -8$ and $y = 2$, evaluate x^y.

   a. -64 b. 16 c. -16 d. 64

7. If $n = 9$, $w = 6$, and $z = -3$, evaluate $|w| + 5n - z$.

   a. 54 b. 48 c. 39 d. 42

8. Which of the following is the translation of "twelve less than a number n"?

   a. $12 - n$ b. $n - 12$ c. $12n$ d. $n + 12$

9. Which of the following is the translation of "eighty from ten"?

a. $10 - 80$ b. $10 + 80$ c. 70 d. $80 - 10$

10. Which of the following is the translation of "three times the sum of a number n plus seven"?

a. $3(n + 7)$ b. $3n + 7$ c. $3n - 7$ d. $7 - 3n$

11. Which of the following is the translation of "twice the difference of a number w less fifteen"?

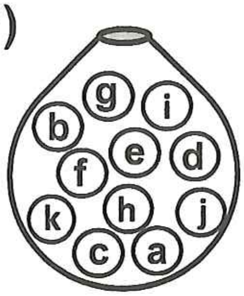
a. $2w - 15$ b. $2(15 - w)$ c. $30w$ d. $2(w - 15)$

12. Which of the following is the translation of "the square of the quantity n less than ten"?

a. $2(10 - n)$ b. $(n - 10)^2$ c. $(n^2 - 10)$ d. $(10 - n)^2$

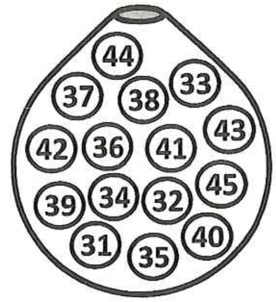
Complete Each Math Analogy

17)



probability of randomly picking a vowel

$: \frac{3}{11} ::$



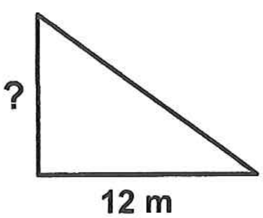
probability of randomly picking a prime number

$:$

18)

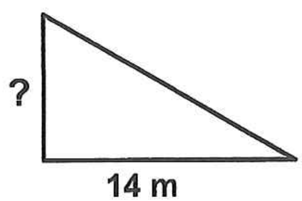
$$\left(1\frac{2}{3}\right)^2 : 2\frac{7}{9} :: \left(2\frac{2}{3}\right)^2 :$$

19)



triangle area = 48 m²

$: 8\text{ m} ::$

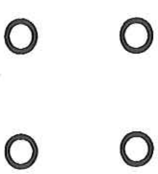


triangle area = 35 m²

$:$

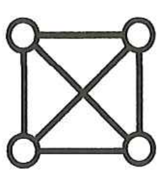
20)

4 dots



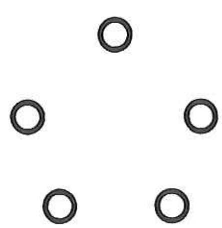
$:$

6 line segments



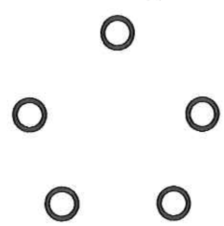
$::$

5 dots



$:$

____ line segments



Week #6

Write the letter of the property which is shown.

_____	1. $-4 + 0 = -4$	a. Associative Property of Addition
_____	2. $5 \cdot 1 = 5$	b. Associative Property of Multiplication
_____	3. $3 \cdot 4 = 4 \cdot 3$	c. Commutative Property of Addition
_____	4. $(-8 + 1) + 2 = 2 + (-8 + 1)$	d. Commutative Property of Multiplication
_____	5. $(9 \cdot 2) \cdot 5 = 9 \cdot (2 \cdot 5)$	e. Addition Property of Zero
_____	6. $1 + (-4 + 2) = \big(1 + (-4)\big) + 2$	f. Multiplication Property of One

Solve the following equations. See *Tips for Solving Equations* in the back of the packet.

7. $-5n = -65$

16. $a + a + 5 + 2a = -30 + 10$

8. $\frac{w}{5} = -1$

17. $-4(n + 5) = 2(n + 2)$

9. $-y = -90$

18. $2 + 3(x + 5) = -13$

10. $x + x + 2 = -14$

19. $11 = -11w + 11$

11. $3r + 1 = -120$

20. $-9(y + 2) + 1 = 10$

12. $-2(n - 1) = 40$

21. $3n - 1 = 2n$

13. $\frac{2}{3}x = -12$

22. $5.6x + 1.4 = 18.2$

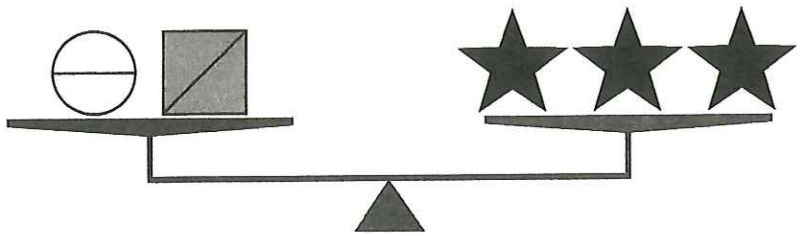
14. $-12 = -\frac{2}{3}x$

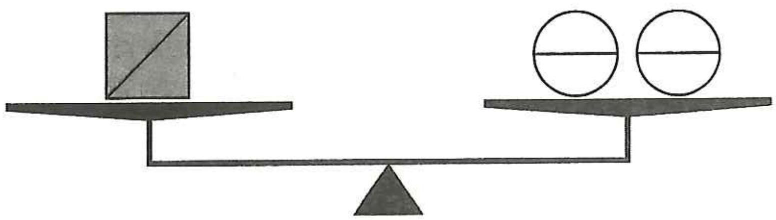
23. $30 + n = 30 + n$

15. $\frac{2}{5}w + 10 = 50$

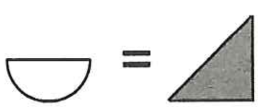
24. $18 + 2n = 2n + 17$

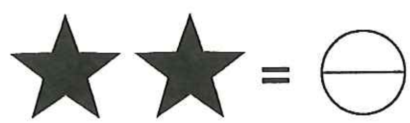
Balance Benders™

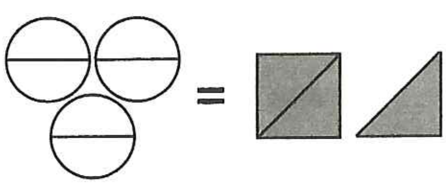


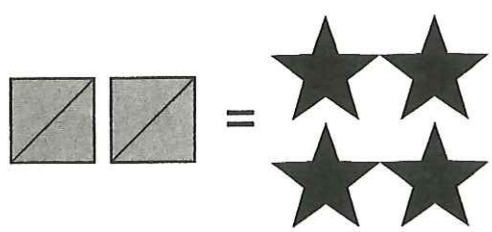


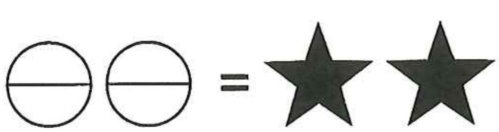
Circle the three answers below that will always be true.

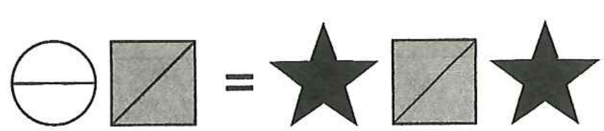
a. 

d. 

b. 

e. 

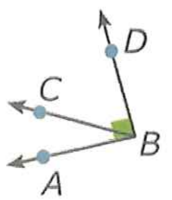
c. 

f. 

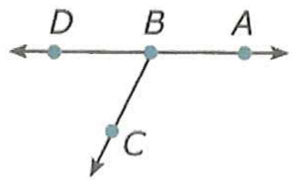
Week #7

Find the missing $\angle ABC$ in each of the figures if $\angle DBC$ is $70°$. The figures are not to scale.

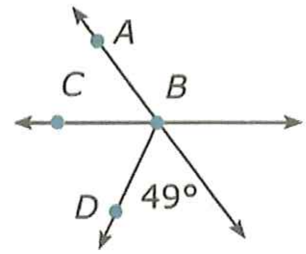
1.



2.



3.



$\angle ABC =$ ________

$\angle ABC =$ ________

$\angle ABC =$ ________

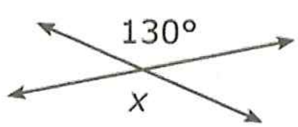
4. Which of the following words can be used to describe $\angle ABC$ and $\angle DBC$ in the above figures? Choose: *complementary, supplementary*, or *adjacent*

a. Problem #1 ____________________________

b. Problem #2 ____________________________

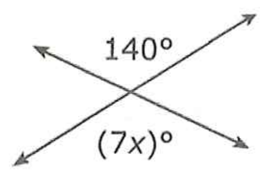
Find the missing x in the figures below. The figures are not to scale.

5.



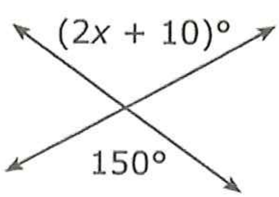
____

6.



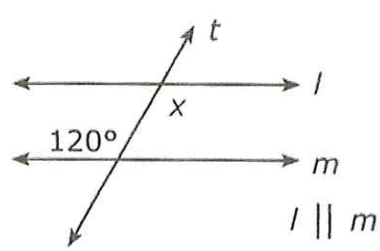
____

7.



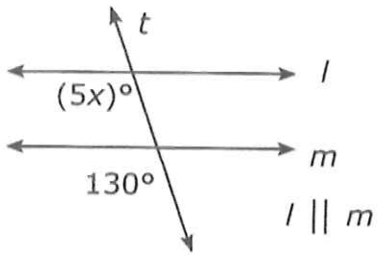
____

8.



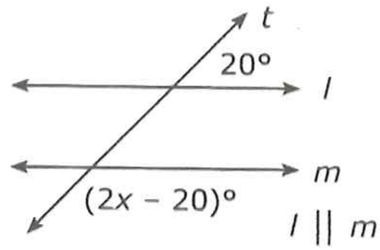
____

9.



____

10.



____

Write the letter of the figure below that matches the description.

_____ 11. Alternate interior angles

_____ 12. Corresponding angles

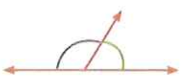
_____ 13. Vertical angles

_____ 14. Perpendicular lines

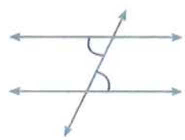
_____ 15. Complementary angles

_____ 16. Supplementary angles

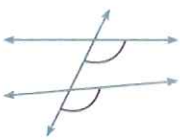
a.



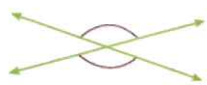
d.



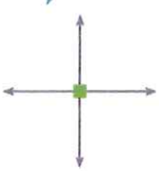
b.



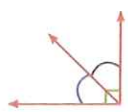
e.



c.

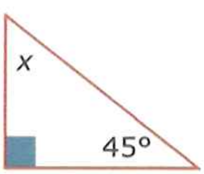


f.



Find the missing x in the following triangles. Then answer the questions.

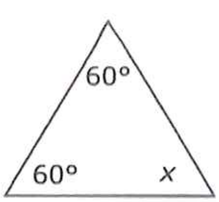
17.



$m\angle x =$ ______ What type of triangle is it?

Explain your thinking.

18.



$m\angle x =$ ______ What type of triangle is it?

Explain your thinking.

Activity 7

Use the clues and the chart to determine the value of each letter, solve the cryptogram, and discover the classic joke.

$n + o = g + k$
$n > 11$
$g > k$

	g	o	n	k
12				
11				
10				
9				

g = ____
o = ____
n = ____
k = ____

$h + r = a + e$
$h \times h = 9$
$e < a$

	h	a	r	e
8				
7				
4				
3				

h = ____
a = ____
r = ____
e = ____

$f + i = 11$
$s + i = f + 3$

	f	b	s	i
6				
5				
2				
1				

f = ____
b = ____
s = ____
i = ____

Cryptogram (Parentheses separate double digits; they have no other meaning.)

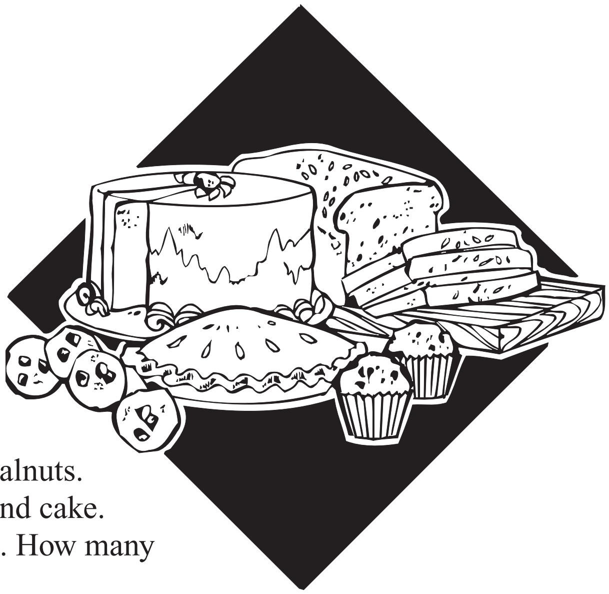
W3y d9 (11)986ll72 37v4 2uc3 16(11) (12)92t86l2?
37v4 y9u 244(12) t3468 56(12)(11)482?

W _ y d _ _ _ _ _ _ ll _ _ _ _ v _ _ uc _ _ _ _
_ _ _ t _ _ l _? _ _ v _ y _ u _ _ _ _ _ t _ _ _ _
_ _ _ _ _ _ _ _?

NAME ____ DATE ______________ PERIOD _____

Week #9 # Real-Life Career Activity

Cake Baker



Some bakers run their own businesses. As well as knowing how to bake, they must know about nutrition, business administration, marketing, and health and safety regulations.

Often bakers must adapt recipes to bake smaller or larger cakes. When the recipe contains fractions, bakers must multiply and divide fractions.

A recipe for a one-pound cake includes $\frac{1}{2}$ cup of walnuts. A baker wants to use the recipe to make a five-pound cake. The baker must multiply all of the ingredients by 5. How many cups of walnuts should she use?

$$\frac{1}{2} \times 5 = 2\frac{1}{2}$$

For the five-pound cake, the baker needs $2\frac{1}{2}$ cups of walnuts.

Solve.

1. A recipe for a two-pound cake includes $\frac{1}{4}$ cup of chocolate chips. A baker wants to make a ten-pound cake. How many cups of chocolate chips does she need?

2. A recipe for a one-pound cake includes $\frac{1}{3}$ cup of sugar. A baker wants to make an eight-pound cake. How many cups of sugar does he need?

3. A recipe for a two-pound cake includes $\frac{1}{2}$ teaspoon of mint flavoring. The baker wants to make a ten-pound cake, but only has two teaspoons of mint flavoring left. Does the baker have enough mint flavoring?

Complete Each Math Analogy

21)

in	out
0	5
1	8
2	11
3	14
4	17
5	20

:

output is 5 more than triple the input

::

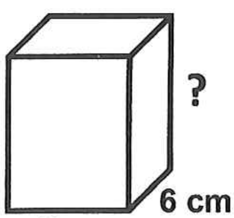
in	out
0	7
1	11
2	15
3	19
4	23
5	27

:

22)

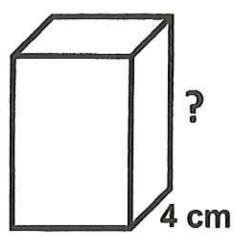
whole numbers between 55 and 70 that are a multiple of 3 : 57, 60, 63, 66, 69 :: whole numbers between 200 and 220 that are a multiple of 3 :

23)



volume = 240 cm³

: 5 cm ::

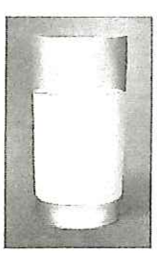


volume = 224 cm³

:

24)

glass is 2/3 full of milk



: glass has room for 4 more ounces of milk ::

same glass is 5/6 full of milk

:

Week #9

Maddie had these cards in a box.

1. If she reaches without looking, what is the probability she will get the “2” card?

2. If she reaches without looking, what is the probability she will get a prime number?

3. In how many ways can Maddie rearrange the cards if repetition of the numbers is not allowed?

4. How many three-digit numbers greater than 400 can you make with Maddie’s numbers, if repetition is not allowed?

Simon has 6 marbles in a can. He has 3 red marbles, 1 blue marble, and 2 green marbles. Simon reaches without looking and chooses one marble. He gives the marble to his sister Mischa, and then reaches to choose another marble. Show the sample space and find the following probabilities.

5. sample space:

6. $P(red, red) =$

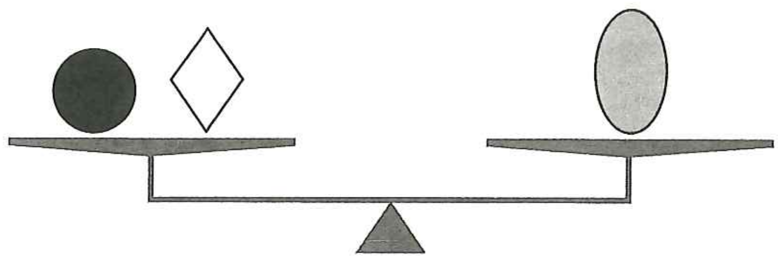
7. $P(red, blue) =$

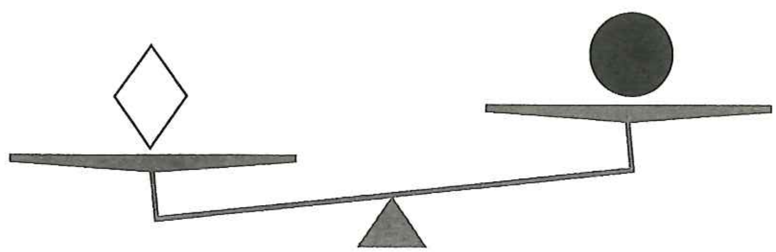
8. $P(green, red) =$

9. $P(blue, blue) =$

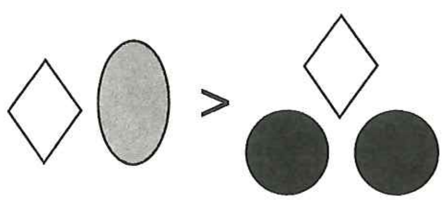
10. For the "Wizard of Oz" musical, there are 10 students trying out for the Munchkin chorus. Only four will be chosen. How many outcomes are possible if all four will be chosen for the same parts?

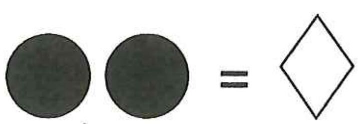
Balance Benders™

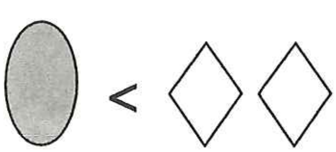


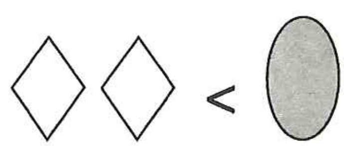


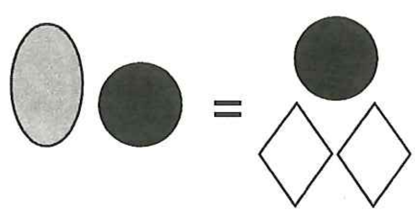
Circle the three answers below that will always be true.

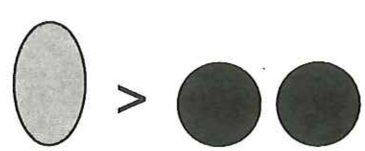
a. 

b. 

c. 

d. 

e. 

f. 

Week #IO

39—Expression Session

[1]Ms. Kamen had a contest to see which student could match the following mathematical expressions in the shortest amount of time. [2]She told her students, "Each of you has an envelope containing fourteen expressions. [3]Each expression matches another expression if their answers are equal. [4]You cannot start until I tell you to, and you must stop when I say stop."

[5]Ms. Kamen added, "Now, remember your properties. [6]The commutative property allows you to add or multiply in any order you wish. [7]The associative property allows you to change how you group your numbers as long as you are adding or multiplying."

[8]Eddie said, "Ms. Kamen, we know all this, let's start the game."

[9]Ms. Kamen said, "Well, Eddie, do you know the name of the property that allows you to say that 5(8 + 7) is the same as 40 + 35?"

[10]Eddie answered, "The 5 is multiplying the sum of 8 plus 7, and that is the same as 5 times 8 plus 5 times 7, right? [11]I know it's the distributive property of multiplication over addition. [12]It also works for multiplication over subtraction. [13]You taught us well. [14]Can we start the game now?"

[15]Ms. Kamen smiled and said, "On your mark, get set, express yourself!"

[15]Below are the expressions Eddie received.

$30 \div 5 \cdot 6$	6^2	$\sqrt{36}$
$(3+9)+8$	$5 \cdot 3^2$	$8+(3+9)$
225	3^2-3	$27-24$
$3(9-8)$	$(5 \cdot 8) \cdot 9$	$5 \cdot (8 \cdot 9)$
45	$(5 \cdot 3)^2$	

Questions

1. Which expression matches with $\sqrt{36}$?

   a. 6^2

   b. $30 \div 5 \cdot 6$

   c. $27 - 24$

   d. $3^2 - 3$

2. When Ms. Kamen asked Eddie what property made the expressions $(3 + 9) + 8 = 8 + (3 + 9)$, Eddie said "the associative property for addition." Is he correct? Use complete sentences to explain your thinking.

   ____

   ____

   ____

3. Explain why $5 \cdot 3^2$ and $(5 \cdot 3)^2$ are completely different expressions. Use complete sentences to explain your thinking.

   ____

   ____

   ____

4. Which two of Eddie's expressions represent the associative property?

   ____________________ ____________________

5. In the expression $30 \div 5 \cdot 6$, how do you know which operation to do first? Use complete sentences to explain your thinking.

   ____

   ____

   ____

6. Which set of Eddie's expressions represents the distributive property?

   ____

   Give the numbers of the two sentences that provide the best evidence for your answer. ______ ______

7. Show two ways of simplifying this expression: $4(25 - 3)$

   ____________________ ____________________

8. See how fast you can match Eddie's expressions.

1.	$30 \div 5 \bullet 6$	a.	$(5 \bullet 8) \bullet 9$
2.	$\sqrt{36}$	b.	$3^2 - 3$
3.	$(3 + 9) + 8$	c.	6^2
4.	$5 \bullet 3^2$	d.	$27 - 24$
5.	$3(9 - 8)$	e.	$(5 \bullet 3)^2$
6.	$5 \bullet (8 \bullet 9)$	f.	$8 + (3 + 9)$
7.	225	g.	45

Activity 8

Use the clues and the chart to determine the value of each letter, solve the cryptogram, and discover the classic joke.

$h + e + i = 30$

$h > i > e$

	i	e	n	h
8				
9				
10				
12				

i = ____

e = ____

n = ____

h = ____

$p \times g = d - 2$

$p > d - 5$

	p	g	o	d
1				
4				
6				
7				

p = ____

g = ____

o = ____

d = ____

$l > a$

$a < t$

$a < s$

$l < s$

$s > t$

$t < l$

	a	l	s	t
2				
3				
5				
11				

a = ____

l = ____

s = ____

t = ____

Cryptogram (Parentheses separate double digits; they have no other meaning.)

(12)7w 678(11) 2 4891u(10)9 bu(10)56 (12)(10)(11)
(12)7u(11)8? (10)1577(11) (10)3 37183(12)8r!

_ _ w   _ _ _ _   _   _ _ _ _ u _ _   bu _ _ _

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