Inspiring Greatness

ISD

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

HS/Essential Math II

April 27, 2020

High School/Essentials of Algebra Course 2
Lesson: April 22, 2020(U5L7 Solving Equations One Chunk at a Time)

Objective/Learning Target:

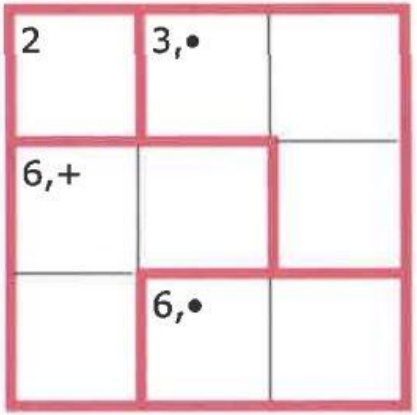
Student will solve equations using properties of operations and the logic of preserving equality.

DIRECTIONS:

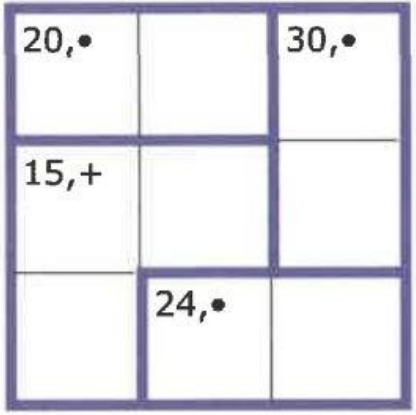
- Scroll through each page
- Read each page
- Attempt each problem on a sheet of paper or in a math notebook/journal

Bellwork

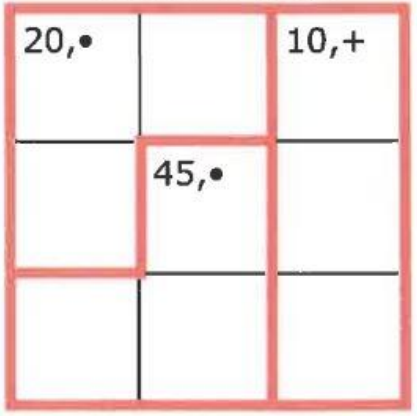
Ⓘ MysteryGrid **1, 2, 3**



Ⓙ MysteryGrid **4, 5, 6**



Ⓚ MysteryGrid **2, 3, 5**



Bellwork Answer Key

(I) MysteryGrid **1, 2, 3**

2 → 2	3,• → 1	3
6,+ → 3	2	1
1	6,• → 3	2

(J) MysteryGrid **4, 5, 6**

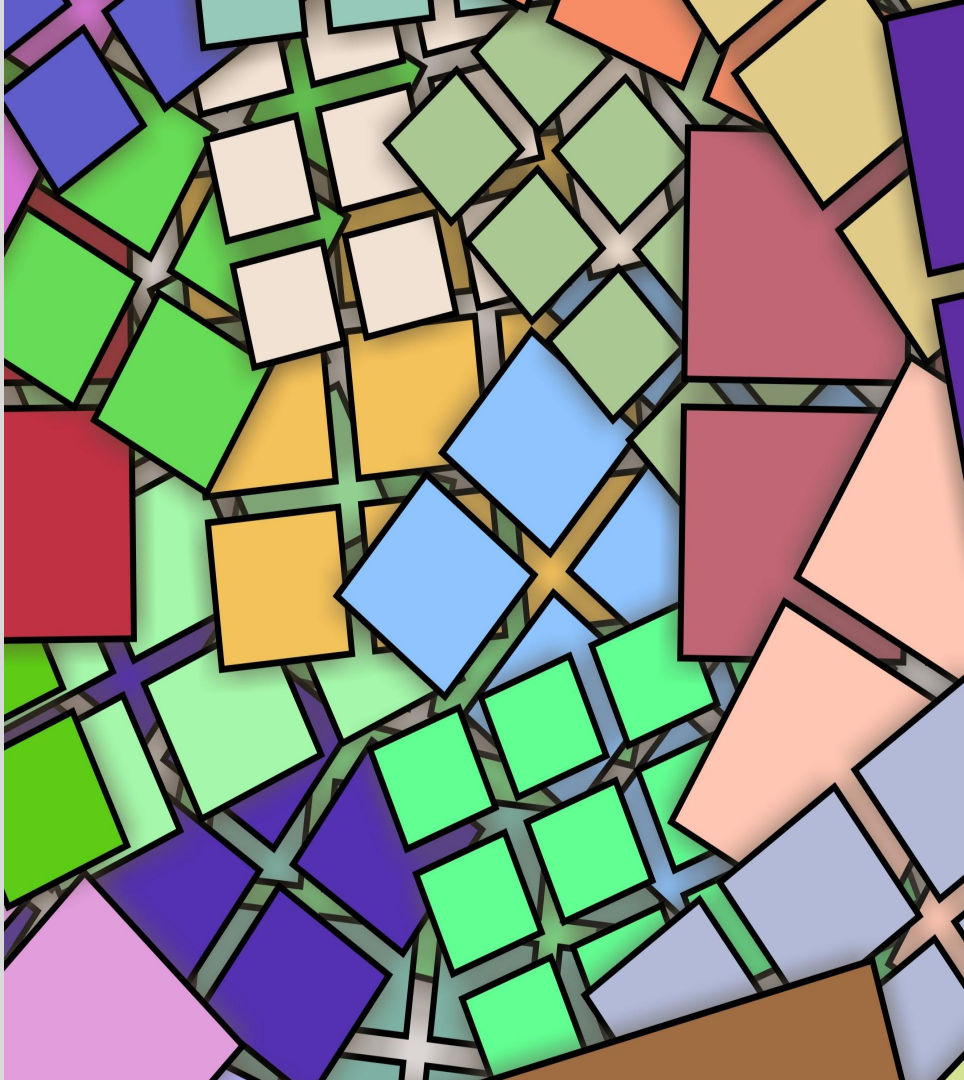
20,• → 4	5	30,• → 6
15,+ → 6	4	5
5	24,• → 6	4

(K) MysteryGrid **2, 3, 5**

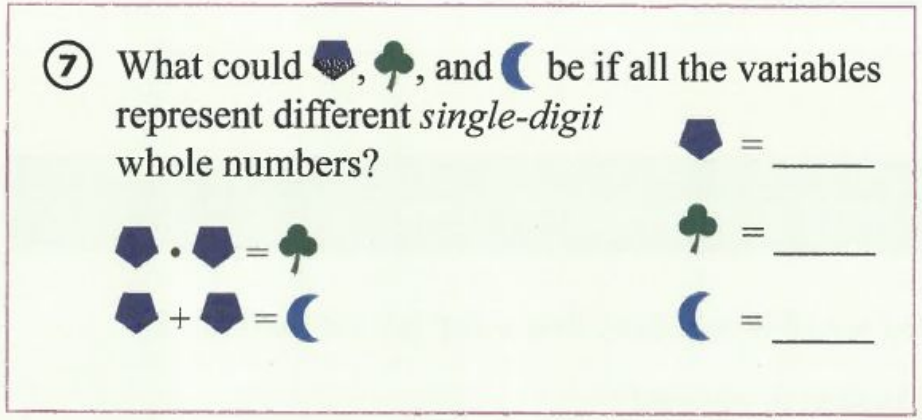
20,• → 5	2	10,+ → 3
2	45,• → 3	5
3	5	2

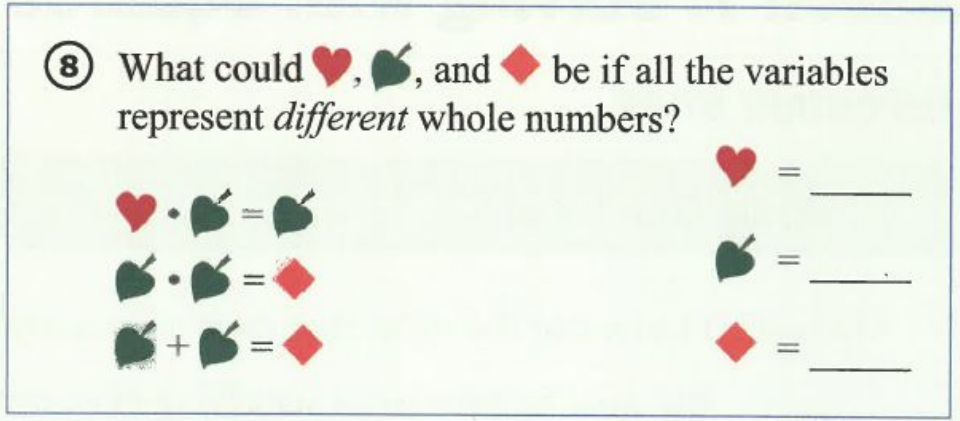
Lesson

Solving with Squares

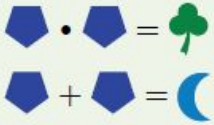


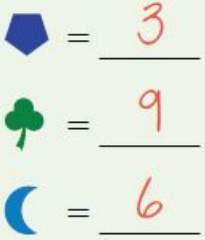
Guess & Test: Playing with Numbers 0 - 9





⑦ What could  ,  , and  be if all the variables represent different *single-digit* whole numbers?



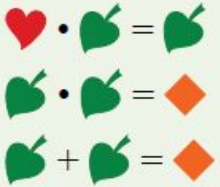


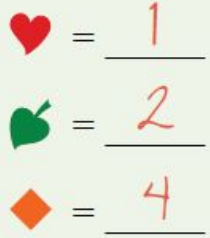
You need numbers that multiply and sum to different numbers but max out at 9.

1 * 1 = 1
Cannot work because the product must be different from factors.

2 * 2 = 4
2 + 2 = 4
Cannot work because the sum & product cannot equal.

⑧ What could  ,  , and  be if all the variables represent *different* whole numbers?





You need numbers that multiply and sum to different numbers but max out at 9.

1 is the only number you can multiply by and get the same number.

2 * 2 = 4
2 + 2 = 4
Cannot work because the sum & product cannot equal.

⑨

Instructions	Record	Jacob	Lena	Asher	Imani	Carla
Think of a number.		4			-1	
			-3	-1		
	$(b-1)^2+7$	16		8	11	7

Addition undoes subtraction

Square root undoes quaring

Subtraction undoes Addition

⑨

Instructions	Record	Jacob	Lena	Asher	Imani	Carla
Think of a number.	b	4	-2	0	-1	1
Subtract 1.	$b - 1$	3	-3	-1	-2	0
Square the result.	$(b - 1)^2$	9	9	1	4	0
Add 7.	$(b - 1)^2 + 7$	16	16	8	11	7

Order of Operations
What happens first and follows?

Reverse Engineer
What happens lasts...step by step?

Zero is neither positive nor negative &
Positive & negative.

Add 7.	$(b-1)^2+7$	16	16	8	11	7

Hiroshi worked through the trick above and got 8 as his final result.
What two numbers could he have been thinking of?

Hiroshi worked through the trick above and got 8 as his final result.
What two numbers could he have been thinking of?

$(b - 1)^2 + 7 = 8$

$(b - 1)^2 = 1$

So: $b - 1 = -1$ OR $b - 1 = 1$

$b = 0$ OR $b = 2$

Hiroshi was thinking of either 0 (like Asher) or 2.

(13) Damian thought of a number, subtracted 8, squared the result, and got 49 as his final result. What two numbers could he have been thinking of?

(14) Maria thought of a number, added 3, squared the result, and subtracted 2. She got 79 as her final result. What two numbers could she have been thinking of?

13 Damian thought of a number, subtracted 8, squared the result, and got 49 as his final result. What two numbers could he have been thinking of?

(Methods may vary for 14 and 15.)

$(n-8)^2 = 49$

$n-8=7$ OR $n-8=-7$

$n=15$ OR $n=1$

14 Maria thought of a number, added 3, squared the result, and subtracted 2. She got 79 as her final result. What two numbers could she have been thinking of?

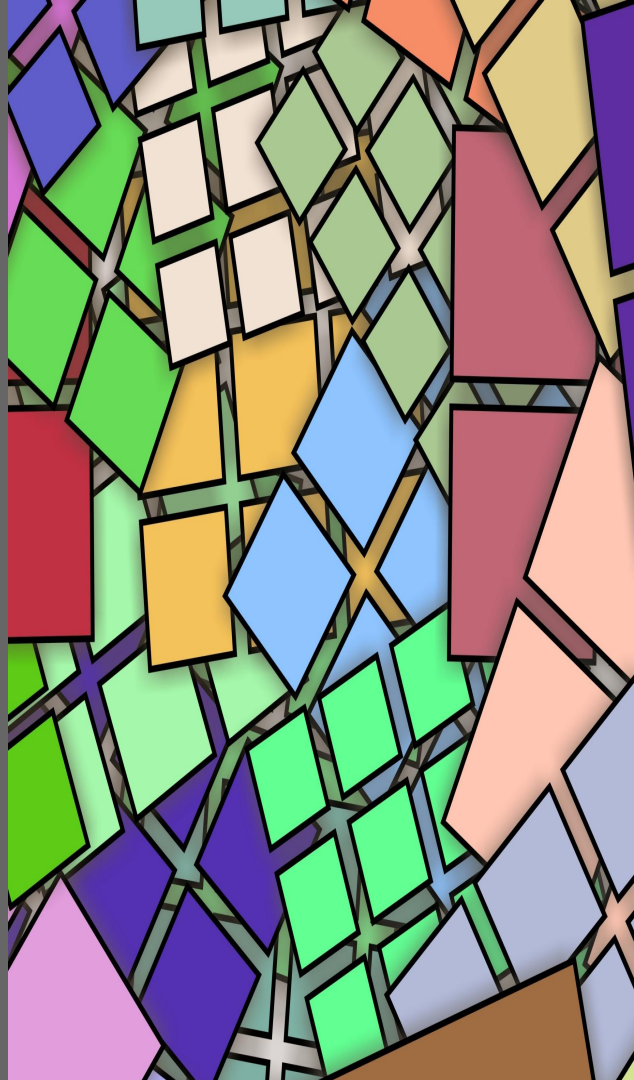
$(n+3)^2-2=79$

$(n+3)^2=81$

$n+3=9$ OR $n+3=-9$

$n=6$ OR $n=-12$

Stuff to Make You Think...

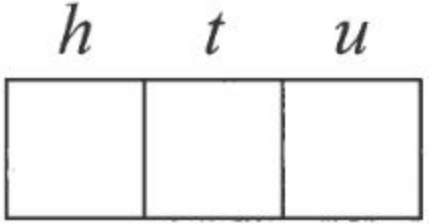


Click on the link below to practice solving Mystery Grid problems electronically. You should practice until you have solved 2 or 3 puzzles on your own.

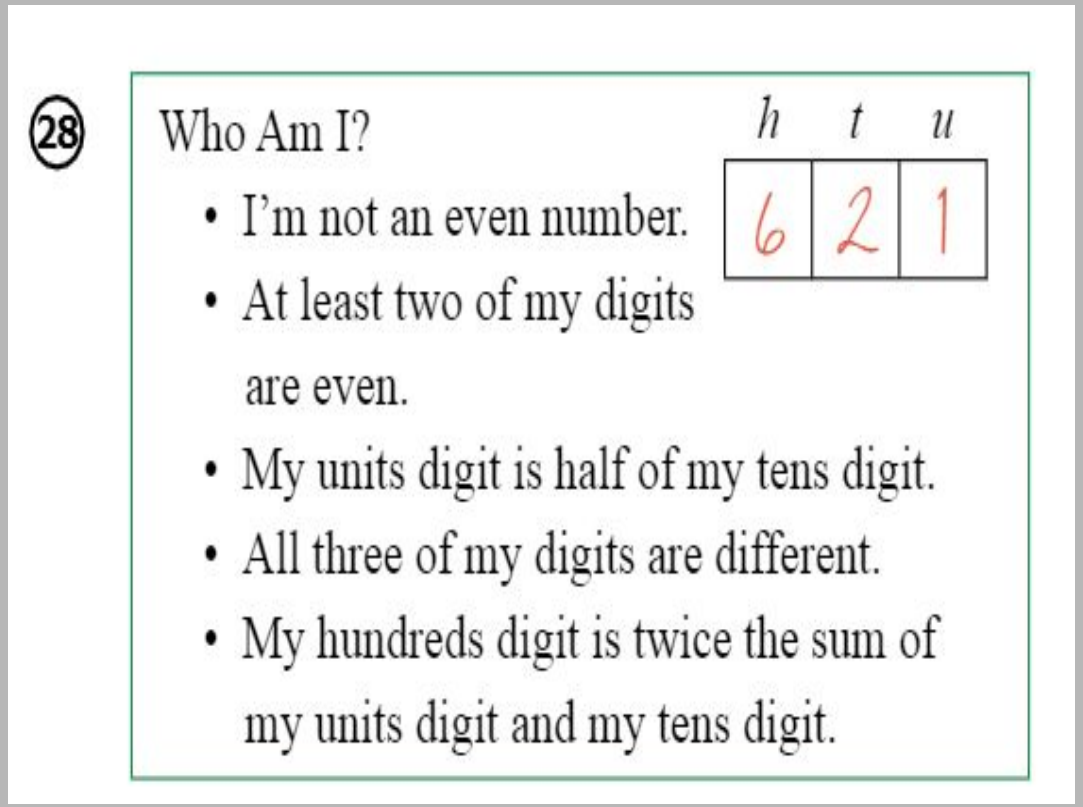
http://www.kenkenpuzzle.com/game

28

Who Am I?

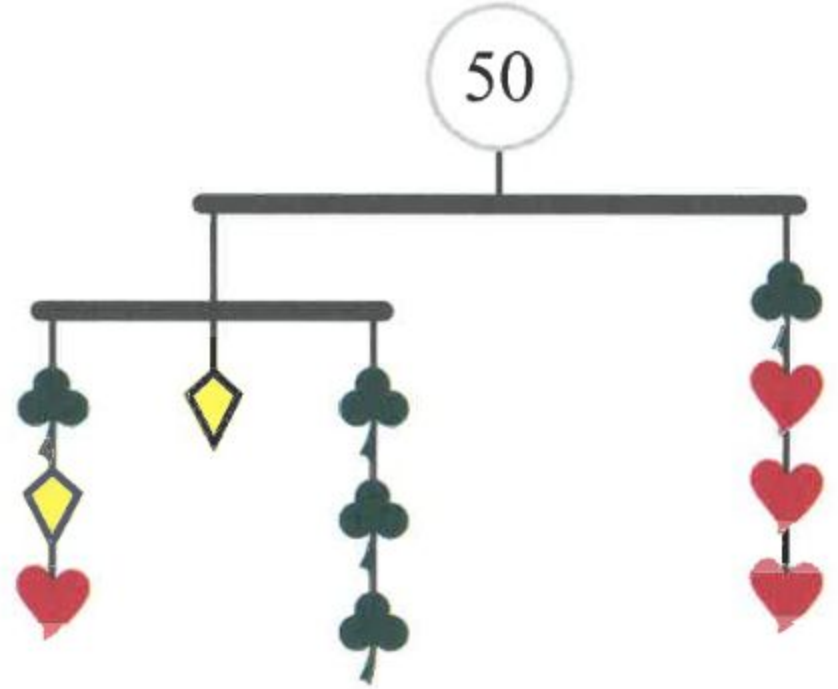


- I'm not an even number.
- At least two of my digits are even.
- My units digit is half of my tens digit.
- All three of my digits are different.
- My hundreds digit is twice the sum of my units digit and my tens digit.



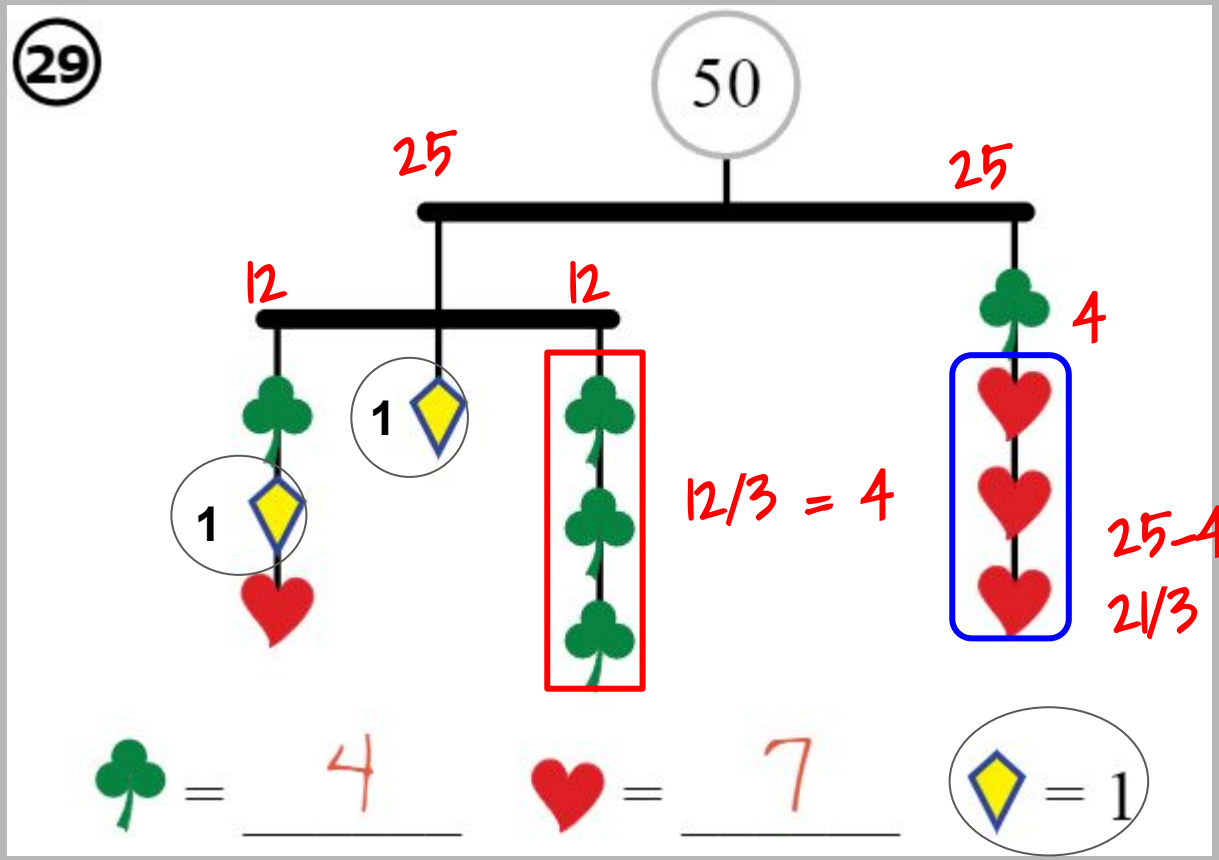
- Not an even means unit is 1,3, 5,7, or 9
- At least two my of digits are even means hundreds and tens are either 0, 2,4,6,or 8 AND hundreds is not zero
- Units is half tens digit means the units is either 1 or 3 and tens is 2 or 6
- Hundreds digit is twice sum of units digit and tens digit means h = 2(u+t)

29



♣ = _____ ♥ = _____ ♦ = 1

29



30 $(m + 5)(4m - 7 - 3m) =$ _____

31 $(7b + 2c)(5c - 8b) =$ _____

30 $(m + 5)(4m - 7 - 3m) =$ $m^2 - 2m - 35$

	4m	-7	-3m
m	$4m^2$	$-7m$	$-3m^2$
5	$20m$	-35	$-15m$

31 $(7b + 2c)(5c - 8b) =$ $19bc - 56b^2 + 10c^2$

	5c	-8b
7b	$35bc$	$-56b^2$
2c	$10c^2$	$-16bc$

32 What could ○, ▲, ✖, ♥, and ☾ be if all the shapes are *different* single-digit numbers (0-9)?

○ · ○ = ○

▲ + ▲ = ▲

○ + ✖ = ♥

✖ + ✖ = ☾

✖ · ✖ = ☾

○ = _____

▲ = _____

✖ = _____

♥ = _____

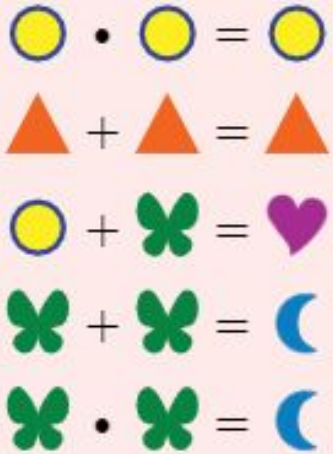
☾ = _____

33 Fill in the empty spaces.

____	x^2	
____	9x	72

(____ + ____) (____ + ____) = $x^2 + 17x + 72$

32 What could ○, ▲, ✤, ♥, and ☾ be if all the shapes are *different* single-digit numbers (0-9)?



○ = 1

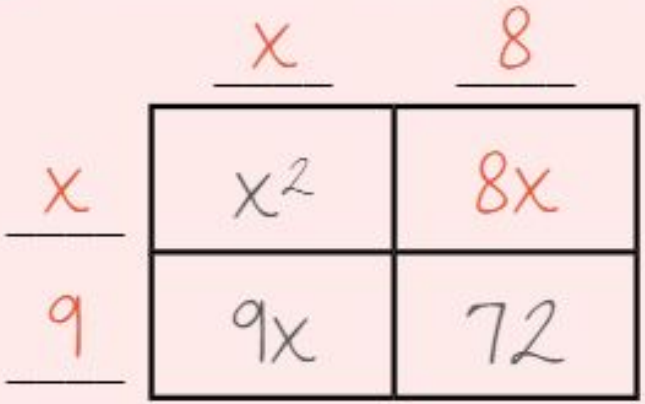
▲ = 0

✤ = 2

♥ = 3

☾ = 4

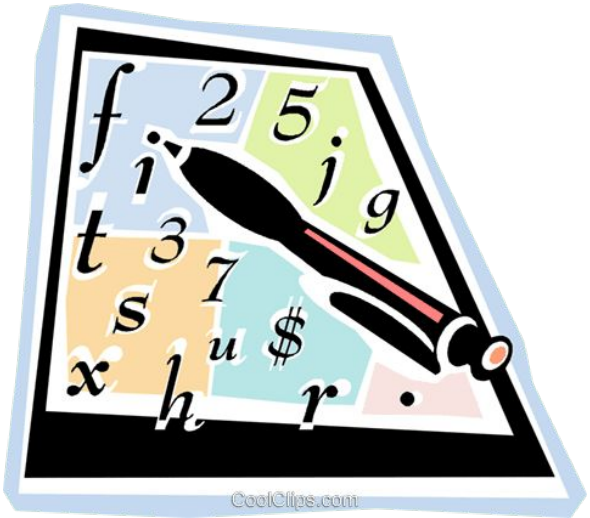
(33) Fill in the empty spaces.



$(\underline{x} + \underline{9})(\underline{x} + \underline{8}) = x^2 + 17x + 72$

or vice versa $(x + 8)(x + 9)$

Additional Practice



Additional Practice 1

Ⓖ $5(12 - x)^2 = 45$

Ⓗ $\frac{(b + 9)^2}{2} = 8$

Cover all but the last instruction and the final result to undo each instruction of the trick in reverse order.

Practice 1 Key

G $5(12-x)^2 = 45 \quad \frac{45}{5} = 9$

$(12-x)^2 = 9 \quad \sqrt{9} = 3 \text{ or } -3$

$12 - x = 3$ OR $12 - x = -3$

-3 -3 +3 +3

$x = 9$ OR $x = 15$

12-9 = 3
x=9

12-15= -3
x= 15

H $\frac{(b+9)^2}{2} = 8$ **8 x 2 = 16**

$(b+9)^2 = 16 \quad \sqrt{16} = 4 \text{ or } -4$

-9 -9 -9 -9

$b + 9 = 4$ OR $b + 9 = -4$

$b = -5$ OR $b = -13$

-5 + 9 = 4

-13 + 9 = -4

Additional Practice 2

(I) Jessica thought of a number, subtracted 7, squared the result, and got 25 as her final result. Find both possibilities for the number she thought of.

Answer Key 2

(I) Jessica thought of a number, subtracted 7, squared the result, and got 25 as her final result. Find both possibilities for the number she thought of.

$(n-7)^2 = 25$ $\qquad \sqrt{25} = 5 \text{ or } -5$

$n - 7 = 5$ (+7, +7) OR $n - 7 = -5$ (+7, +7)

$n = 12$ OR $n = 2$

Additional Practice 3

(J) Michael thought of a number, doubled it, added 3, squared the result, and got 81 as his final result. Find both possibilities for the number he thought of.

Answer Key 3

(J) Michael thought of a number, doubled it, added 3, squared the result, and got 81 as his final result. Find both possibilities for the number he thought of.

$(2n + 3)^2 = 81$ $\sqrt{81} = 9$ or -9

$2n + 3 = 9$ (-3 -3) OR $2n + 3 = -9$ (-3 -3)

$\frac{2n = 6}{2}$ OR $\frac{2n = -12}{2}$

$n = 3$ OR $n = -6$

Additional Resources

Student will solve equations using properties of operations and the logic of preserving equality.

CLICK THE LINKS BELOW FOR ADDITIONAL PRACTICE:

SolveMe Mobiles

Who Am I? Puzzles

Solve Me Mystery Grids