

*A long time ago
in a galaxy
far, far away...*

STAR WARS MATH



SIXTH GRADE MATHEMATICS

CHAPTER 2

ALGEBRAIC REASONING

BROUGHT TO YOU BY:

EVIL MATH VADER

(BETTER KNOWN AS MR. MANGHAM)

TOPICS COVERED:

- ❖ Kaadu Egg Algebra (Expressions)
- ❖ Jedi Arenas (Equations)
- ❖ Variables and Equations
- ❖ Mental Math Equations
- ❖ Hands-On Equations – Addition & Subtraction
- ❖ One-Step Equations – Addition & Subtraction
- ❖ One-Step Equations – Multiplication & Division

Pick your top 5 characters (rank 1 to 5)

My Pick	Star Wars Character	Height	Brains	Dark Side	Jedi Powers	Battle Skills	Force Factor
		<i>h</i>	<i>b</i>	<i>d</i>	<i>j</i>	<i>s</i>	<i>f</i>
	Luke Skywalker	1.72m	15	4	90	43	4
	Princess Leia	1.5m	17	1	50	38	4
	Chewbacca	2.28m	12	5	10	55	4
	C3PO	1.67m	19	0	0	8	6
	R2D2	0.96m	14	0	0	14	6
	Lando Calrissian	1.78m	15	8	6	48	2
	Obi-Wan Kenobi	1.75m	18	1	80	26	6
	Yoda	0.66m	20	0	100	10	5
	Wedge Antilles	1.7m	11	3	10	37	3
	Imperial Stormtrooper	1.83m	9	19	1	49	3
	Jabba the Hutt	3.9m	13	20	0	10	3
	Darth Vader	2.02m	16	22	82	55	4
	Emperor Palpatine	1.73m	14	25	95	25	5
	Boba Fett	1.83m	11	20	17	49	4
	Han Solo	1.8m	13	6	4	50	3
	Anakin Skywalker	1.93m	16	10	82	55	4
	Qui-Gon Jinn	1.95m	19	2	65	41	1
	Queen Amidala	1.65m	17	2	30	40	3
	Jar Jar Binks	1.96m	2	5	20	30	3
	Darth Maul	1.75m	9	24	80	48	1

What is your Star Wars name?

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Your first name: First three letters of your last name + First two letters of your first name
Your last name: First two letters of your mom's maiden name + First three letters of the city where you were born

Dear Teacher,

When I started school, I learned about the letter “X”. You taught me that this letter “X” really has the sound of the letter “Z” as in Xylophone and Xerox.

As I got older, you combined this letter “X” with some numbers. Now this letter “X” means to multiply, as in $3 \times 4 = 12$.

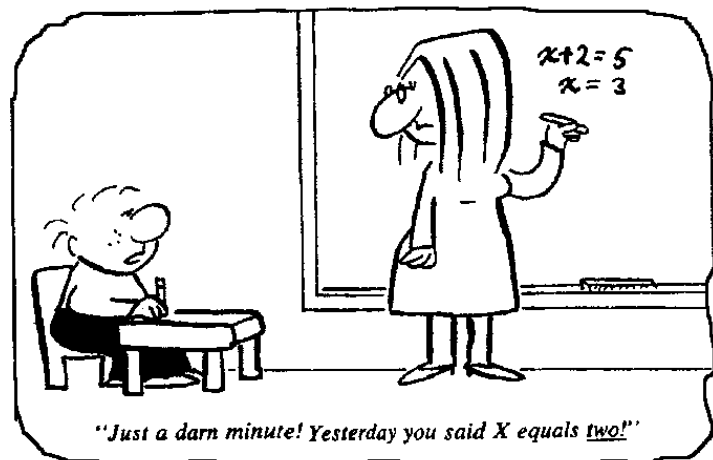
To make matters worse, you stacked the numbers and added the digits. You combined this with the letter “X” and you wanted me to follow a series of steps to multiply, as in 496×24 .

Just when I’ve gotten used to multiplying when I see this letter “X”, you take it away, telling me I can use a dot to multiply, as in $2 \bullet 3 = 6$.

Now here I am in Algebra class, and wouldn’t you know it!! The letter “X” is back. Only this time you’ve finally said something that makes sense. This letter “X” can be anything!! It varies! You call it a variable! My question is, why did you wait so long to tell me this?

Your student

YOU KNOW, I DON'T
THINK MATH IS A SCIENCE.
I THINK IT'S A RELIGION.
ALL THESE EQUATIONS
ARE LIKE MIRACLES YOU
TAKE TWO NUMBERS AND WHEN
YOU ADD THEM, THEY MAGICALLY
BECOME ONE *NEW* NUMBER!
NO ONE CAN SAY HOW IT
HAPPENS. YOU EITHER BELIEVE
IT OR YOU DON'T.



Algebra is the science of calculating by symbols and takes its name from the Arabic “al-jabr” which means the reunion. The term was originally applied to the resetting of broken bones, but is later used for anything broken, therefore the combination or reintegration of numbers.

Vocabulary:

A **variable** is a symbol used to represent one or more numbers.

A **variable expression** is a mathematical phrase that uses numbers, variables, and operation symbols.

Variable expressions are made up of one or more terms.

A **term** is a number, a variable, or the product or quotient of a number and a variable.

An **equation** describes a relationship between two expressions.

These variables represent information about a school.

t = number of teachers at the school	g = number of girls at the school
m = number of math teachers at the school	p = number of class periods in one day
b = number of boys at the school	l = length of one class period, in minutes

Tell what each of the following expressions represents.

1.	$t + b + g$	
2.	pl	
3.	$\frac{(b + g)}{t}$	
4.		
5.		

Write an expression for each of the following.

6.	the total number of class periods per week	
7.	the number of teachers who do not teach math	
8.	the percentage of teachers who teach math	
9.		
10.		

Use the variables above or ones that you or the class added to describe your ideal school using equations. Two examples have been completed for you.

11.	There are twice as many girls as boys.	$g = 2b$
12.	35% of all teachers are math teachers.	$m = .35t$
13.		
14.		
15.		

Vocabulary:

A **variable** is a symbol used to represent one or more numbers.

A **variable expression** is a mathematical phrase that uses numbers, variables, and operation symbols.

Variable expressions are made up of one or more terms.

A **term** is a number, a variable, or the product or quotient of a number and a variable.

These variables represent information about a particular math class.

s = number of students in the class	g = number of girls in the class
r = number of students in the class with red hair	b = number of students in the class with black hair
t = number of textbooks given to each student	h = number of hours of classes each day

Tell what each of the following expressions represents.

1.	$s-g$		4.	$s-b$	
2.	$5h$		5.	st	
3.	$b+r$		6.	$\frac{g}{s} \cdot 100$	

Write an expression for each of the following.

7.	the number of students who do not have red hair	
8.	the number of textbooks handed out to girls	
9.	the number of minutes of classes each day	
10.	the number of textbooks handed out to all the students	
11.	the percentage of students who have black hair	

Write an equation for each of the following.

12.	there are 16 more students with black hair than students with red hair	
13.	there are twice as many students as girls	
14.	40% of the students have black hair	

Translate each equation into words. Then make a table showing four pairs of sample values that fit the equation.

15.	$s = b + 21$		
16.	$b = 4r$		
17.	$s = 2g + 5$		

18.	Write an equation that says that y is equal to 1.25 times x . Then make a table of values that fit the equation. For x , pick whole numbers ranging from 1 to 10. Write y as a decimal. Show all work on a separate sheet of paper.
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Often times certain code words can help you determine what type of operation is necessary in a word problem. Be careful, though, because the code word does not always mean just one operation. You must still read the problem carefully to make sure your choice of operations makes sense.

ADDITION CODE WORDS

Word	Example
sum	What is the sum of 5 and 3?
in all	There were 5 cats and 3 dogs. How many animals were there in all?
altogether	There were 5 boys and 3 girls at school. How many students are there altogether?
total	He scored 5 points and then 3 more points. How many total points did he score?
spend/spent	She bought a shirt for \$25 and shoes for \$50. How much money did she spend?
combined	How much is 5 and 3 combined?
joined	If 5 pirates joined 3 other pirates, how many pirates are there?
plus	What is 5 plus 3?
both	He has 5 cards and she had 3 cards. How many cards do they both have?
and	How much is 5 and 3?
more	5 penguins were playing. 3 more arrived. How many penguins are there?

SUBTRACTION CODE WORDS

Word	Example
difference	What is the difference between 8 and 2?
left	8 cats were in the room. 2 disappeared. How many cats are left?
less	What is 8 less 2?
minus	What is 8 minus 2?
change	He bought a watch \$18 and gave the clerk a \$20 bill. How much change did he get?
profit	She bought a stock for \$200 and sold it for \$800. How much profit did she make?
off	The \$8 pencil's price was changed to \$2. How many dollars off was the pencil?
more	The house has 8 people and the tent has 2. How many more live in the house?
"er" words	One can hold 2 liters and one hold 8 liters. How much bigger is the 8 liter can?

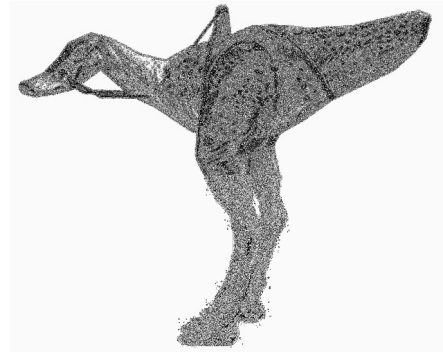
MULTIPLY CODE WORDS

Word	Example
product	What is the product of 5 and 7?
times	What is 5 times 7?
twice	5 people ate. Twice as many sang. How many people were singing?
Before the question words such as: each, per, every, one, apiece	If 5 people each had 7 watermelons, how many watermelons were there?

DIVIDE CODE WORDS

Word	Example
quotient	What is the quotient of 12 and 3?
separate	How many separate groups of 3 can you make with 12 buttons?
equal	How many equal groups of 3 can you make with 12 buttons?
half	What is half of 12?
In the question words such as: each, per, every, one, apiece	If 3 students had 12 strawberries, how many strawberries are there per each student?

Kaadu lived on the planet Naboo. They were large flightless waterfowl. They were excellent runners and strong swimmers. They laid their eggs on land. Gungans like Jar Jar Binks rode on the kaadu.

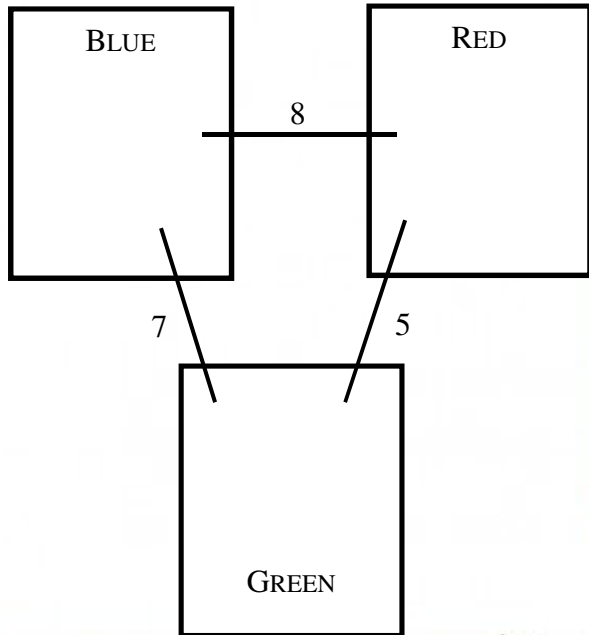


Egg carton letter:	Egg carton letter:
Egg carton letter:	Egg carton letter:
Egg carton letter:	Egg carton letter:

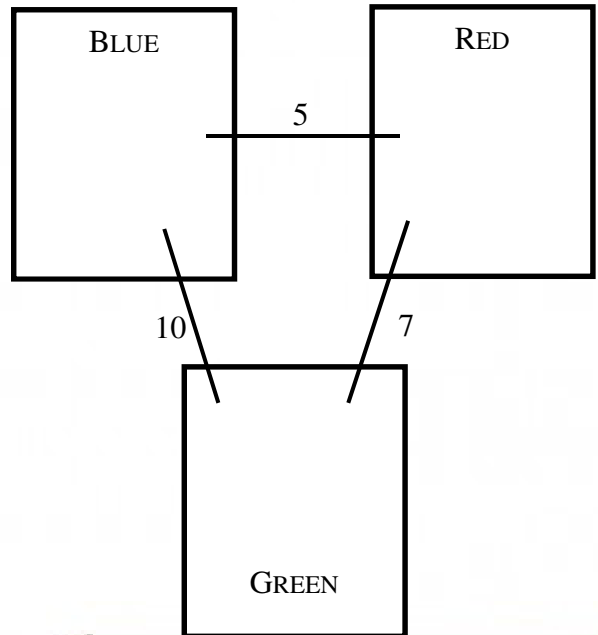
Jedi 1

There are many jedi, like Luke Skywalker and Obi-Wan Kenobi, in the arenas below. The arenas are connected by bridges. The number on each bridge tells the total number of jedi in the two arenas it connects. Use cubes to show how many jedi are in each arena.

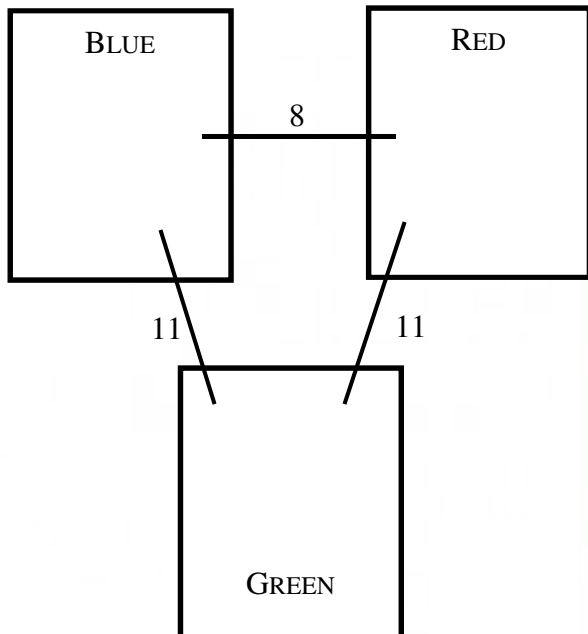
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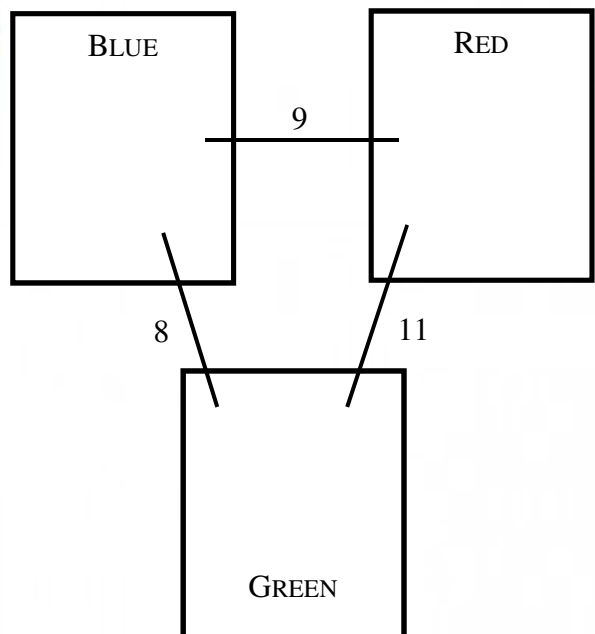
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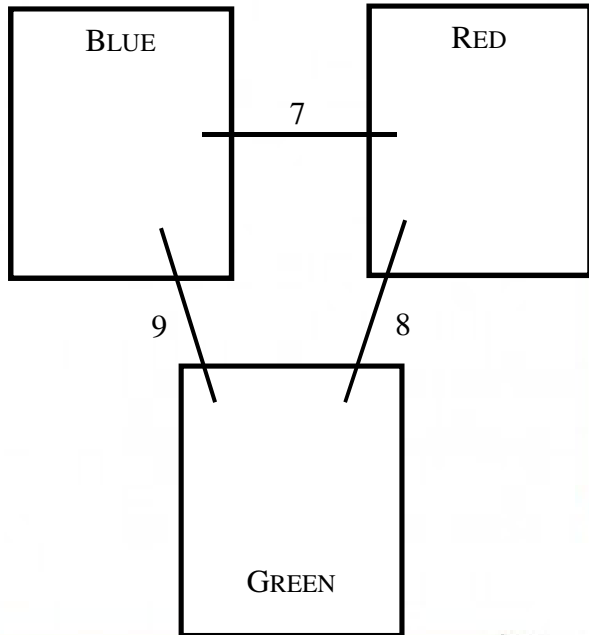
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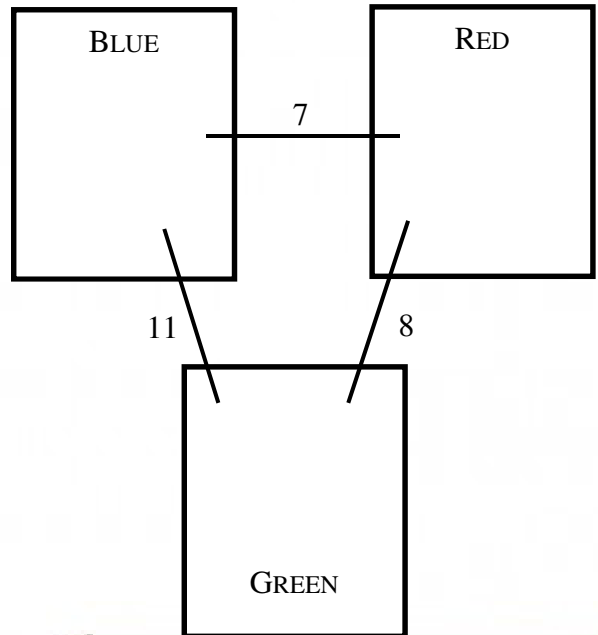
Jedi 2

There are many jedi, like Luke Skywalker and Obi-Wan Kenobi, in the arenas below. The arenas are connected by bridges. The number on each bridge tells the total number of jedi in the two arenas it connects. Use cubes to show how many jedi are in each arena.

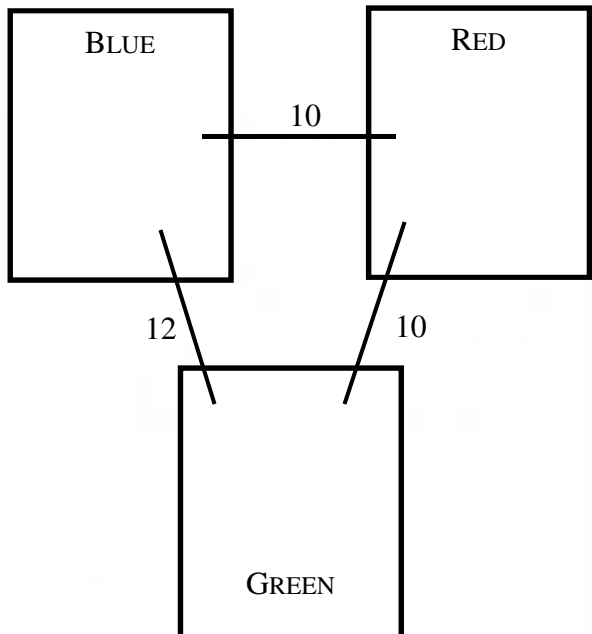
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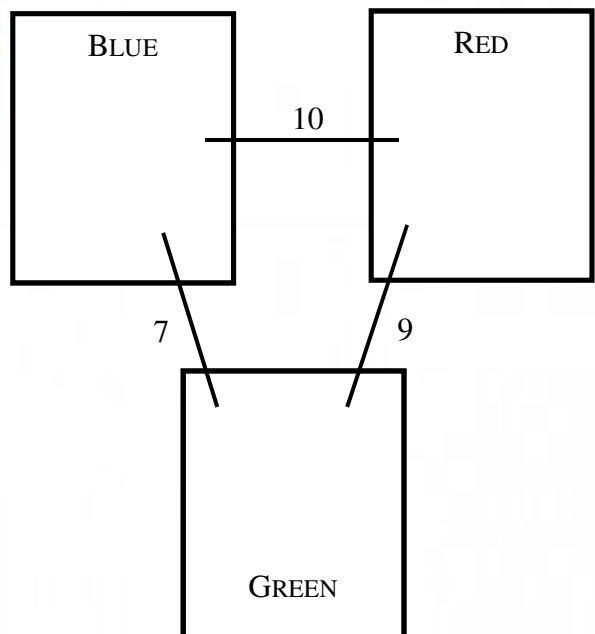
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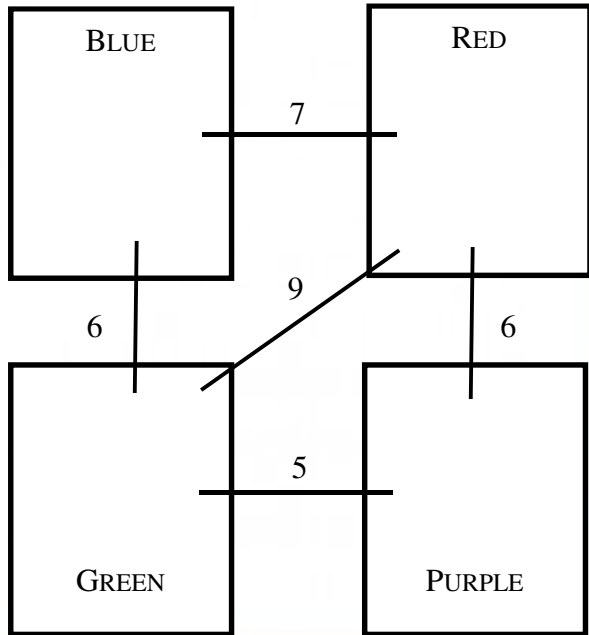
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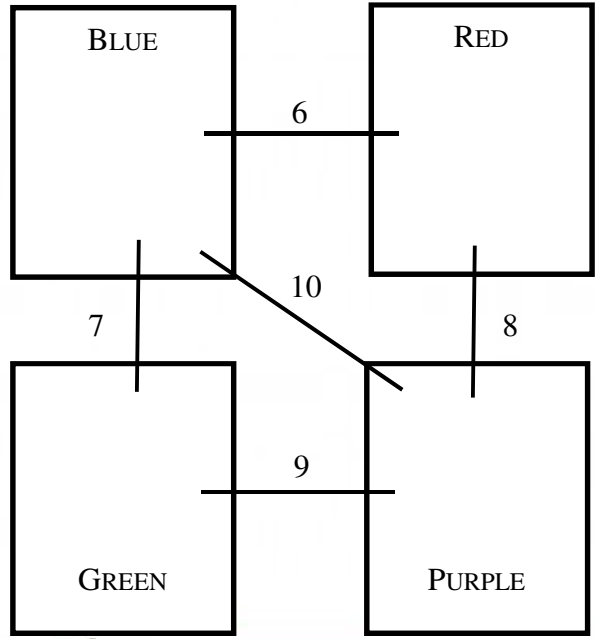
Jedi 3

There are many jedi, like Luke Skywalker and Obi-Wan Kenobi, in the arenas below. The arenas are connected by bridges. The number on each bridge tells the total number of jedi in the two arenas it connects. Use cubes to show how many jedi are in each arena.

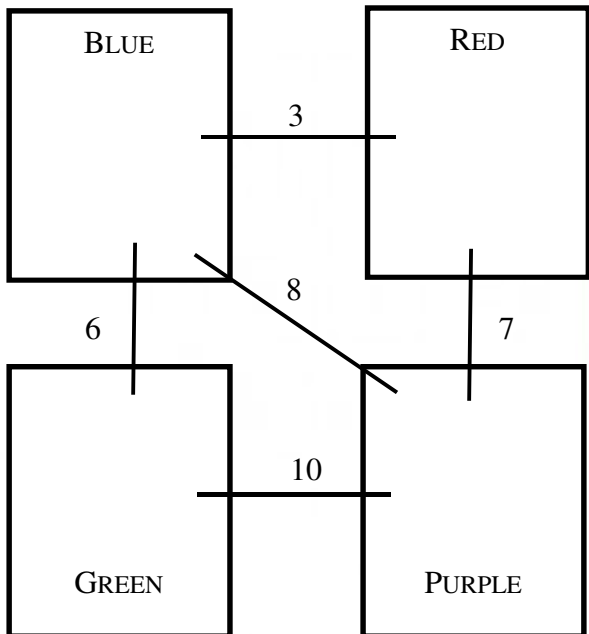
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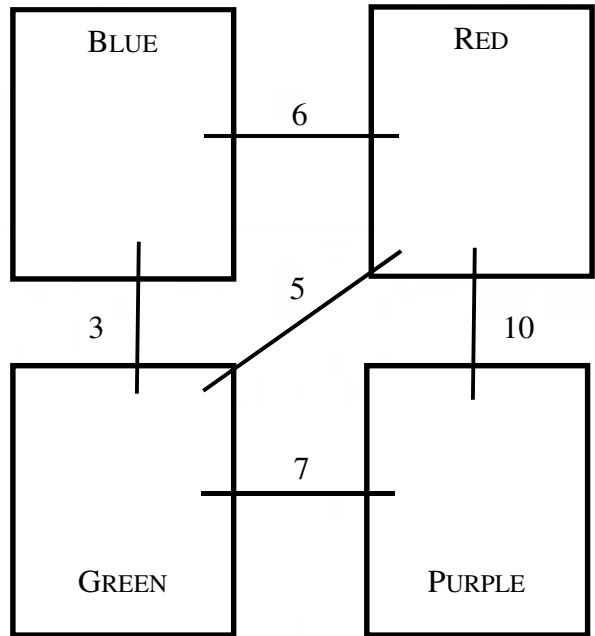
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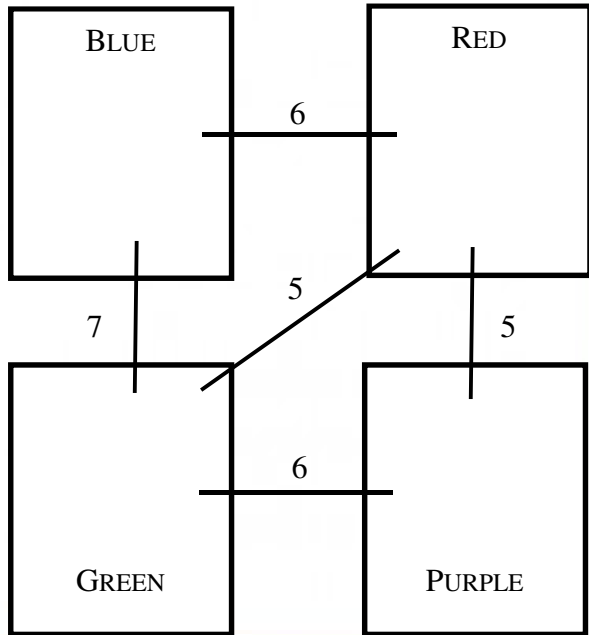
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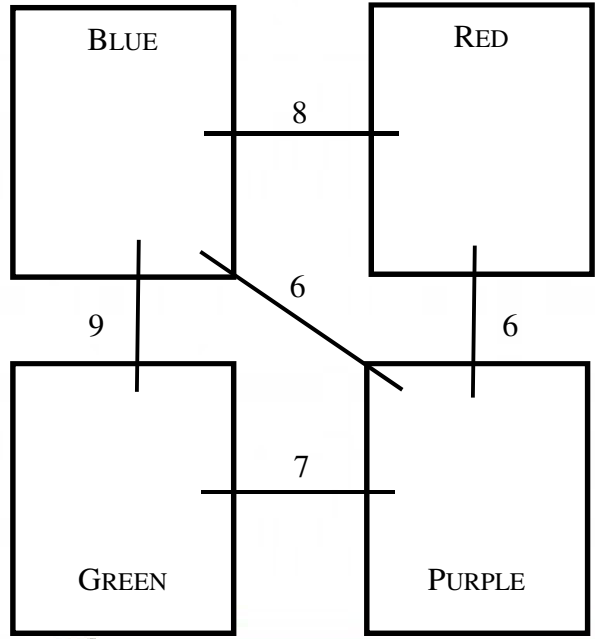
Jedi 4

There are many jedi, like Luke Skywalker and Obi-Wan Kenobi, in the arenas below. The arenas are connected by bridges. The number on each bridge tells the total number of jedi in the two arenas it connects. Use cubes to show how many jedi are in each arena.

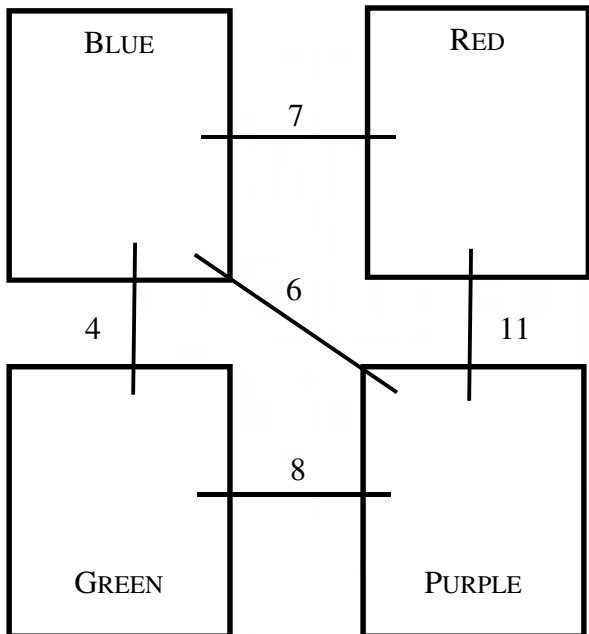
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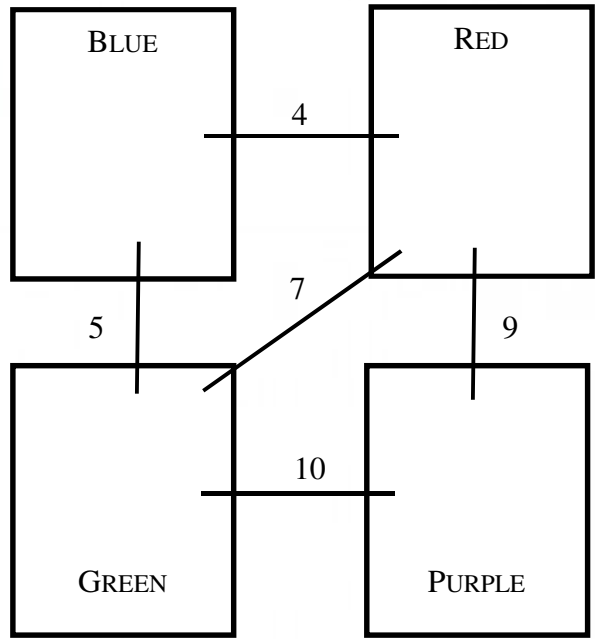
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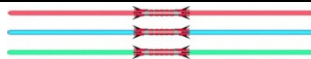
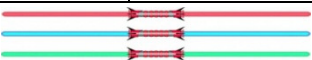
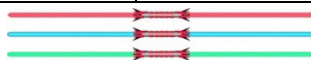
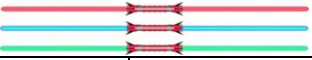
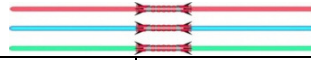
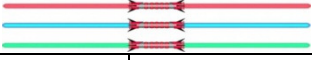
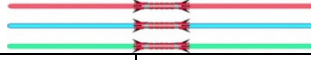


3.



4.



Jedi 3 #1 		Jedi 3 #2 	
EQUATIONS:	ANSWERS:	EQUATIONS:	ANSWERS:
Jedi 3 #3 		Jedi 3 #4 	
EQUATIONS:	ANSWERS:	EQUATIONS:	ANSWERS:
Jedi 4 #1 		Jedi 4 #2 	
EQUATIONS:	ANSWERS:	EQUATIONS:	ANSWERS:
Jedi 4 #3 		Jedi 4 #4 	
EQUATIONS:	ANSWERS:	EQUATIONS:	ANSWERS:

Phrases	Expression	Phrases	Expression
9 more than a number the sum of 9 and a number a number plus 9 a number increased by 9 the total of x and 9	$x + 9$	4 subtracted from a number a number minus 4 4 less than a number a number decreased by 4 the difference of h and 4	$h - 4$
Phrases	Expression	Phrases	Expression
6 multiplied by g 6 times a number the product of g and 6	$6g$	a number divided by 5 the quotient of t and 5 divide a number by 5	$\frac{t}{5}$

Phrases	Equation
Sixty less than three times a number is \$59. Three times the amount less 60 is equal to 59. 59 is equal to 60 subtracted from three times a number. A number times three minus 60 equals 59.	$3n - 60 = 59$

On a separate sheet of paper, write each phrase as an algebraic expression or equation.

1.	the total of 5 and c	2.	23 divided into y
3.	the product of k and 9	4.	the difference of 6 and r
5.	nine less than t	6.	a number increased by 7 is 11
7.	the price decreased by \$4 is \$29	8.	twice as many points as Bob would be 18 points
9.	after dividing the money 5 ways, each person got \$67	10.	three more than 8 times as many trees is 75 trees
11.	seven less than a number is 15	12.	700 divided by a number
13.	fourteen divided by a number is 21	14.	four times the number of feet is 12 feet
15.	27 is seven fewer students than last year	16.	the number of cats decreased by 17 is 19
17.	two and one-half times the amount of interest is \$2,500	18.	one hundred increased by a number is 537
19.	81 increased by n	20.	the sum of b squared and h
21.	\$15 times the number of hours	22.	five less than a six times a number is equal to 5
23.	12 times the number of muffin pans	24.	the quotient of five divided by the sum of g and k
25.	two times a number decreased by 5 is equal to 8	26.	a service charge of \$20 plus a charge of \$3 per window cleaned
27.	two times a number decreased by 8 is 23	28.	five times a number divided by 8 is one
29.	three times the difference of a number and nine equals 15	30.	the difference of six squared and a number is nine

31. Which word phrase does not describe the expression $24 - x$?

a. 24 decreased by x	b. the difference of 24 and x
c. 24 minus x	d. 24 less than x

Evaluate each expression if $y = 15$.

1.	$y - 9$		2.	$y \div 5$		3.	$6 + y$	
4.	$30 \div y$		5.	$3y$		6.	$28 - y$	

Evaluate each expression if $r = 6$ and $s = 8$.

7.	$15 - s$		8.	$s - r$		9.	$s \div 2$	
10.	sr		11.	$4s$		12.	$s + r + 16$	

Evaluate each expression if $j = 2$, $k = 7$, and $m = 9$.

13.	$2m - 5j$		14.	$3m + j$		15.	$42 \div k + m$	
16.	$j + m - k$		17.	$2j + k - m$		18.	$jm - k$	

Evaluate each expression if $x = 5$, $y = 4$, and $z = 3$.

19.	$x + z$		20.	$y + 3 - z$		21.	$x - x + 4$	
22.	$xy - 2$		23.	$yz + 10$		24.	$xz + 4$	

For all problems 25-45, use the tornado method and show all work on a separate sheet of paper.

Evaluate each expression if $a = 8$, $b = 4$, and $c = 2$.

25.	$\frac{a}{b} + 5$		26.	$3bc$		27.	$\frac{b}{c} + a$	
28.	$\frac{2a}{4} - b$		29.	$3(b + a) - c$		30.	$2b - 3c$	
31.	$\frac{2b}{c}$		32.	$\frac{6(a + c)}{b}$		33.	$b(b + a) - b$	

Evaluate each expression if $a = 12$, $b = 3$, and $c = 4$, $m = 9$, $n = 3$.

34.	$\frac{m}{n} + 6$		35.	$10mn$		36.	$\frac{a}{c} - b$	
37.	$\frac{3n}{m} + 4$		38.	$3(n + n) - m$		39.	$4c - 3b$	
40.	$10 - \frac{2m}{n}$		41.	$\frac{3(b + c)}{(b + c)}$		42.	$b(c - b) + c$	

Evaluate each algebraic expression for the given values of the variables.

43.	$(b^2 - c) \cdot d - 4$, for $b = 6$, $c = 4$, and $d = 12$	
44.	$(a + b^2) \cdot c \div d$, for $a = 7$, $b = 2$, $c = 6$, and $d = 3$	
45.	$s^2 - 3 \cdot t \div v$, for $s = 5$, $t = 7$, and $v = 3$	

Will Anakin Skywalker restore order to the force? Will you restore order to the operations?

For all problems on this page, show all work using the tornado method on a separate sheet of paper.
When necessary, round answers to the nearest tenth.

Back at the beginning of this unit you chose a Star Wars character to be for this unit. For the following order of operations, use your character and the numbers given to solve the following problems.

1.	The Tall and Small Index	$10h + 2b - d$	
2.	The Smart Heart Index	$4(2b^2 - df)$	
3.	The Dark Mark Index	$\frac{50d + 2s}{f}$	
4.	The Power Hour Index	$\frac{jsf}{(f + 4)}$	
5.	The Skill and Chill Index	$4(b + j) - \frac{d}{2}$	
6.	The Force is the Source Index	$100f^2 + 5j - 3d$	

Apply the same indices to one of the following characters: C3PO, Qui-Gon Jinn, or Jabba the Hut.

7.	The Tall and Small Index	$10h + 2b - d$	
8.	The Smart Heart Index	$4(2b^2 - df)$	
9.	The Dark Mark Index	$\frac{50d + 2s}{f}$	
10.	The Power Hour Index	$\frac{jsf}{(f + 4)}$	
11.	The Skill and Chill Index	$4(b + j) - \frac{d}{2}$	
12.	The Force is the Source Index	$100f^2 + 5j - 3d$	

Create a brand new index name and formula and apply it to the characters below.

New name:	New formula:
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13.	Yoda		14.	Darth Maul	
15.	Chewbacca		16.	Princess Leia	

Translate each phrase below into an algebraic expression. Write the correct letter next to each expression.

1.		3 times a number
2.		3 more than a number
3.		3 decreased by a number
4.		3 less than a number
5.		one third of a number
6.		8 more than 3 times a number
7.		8 less than 3 times a number

A	$x + 3$
B	$3x - 8$
C	$x - 3$
D	$3x + 8$
E	$3x$
F	$3 - x$
G	$\frac{x}{3}$

8.		7 less than 4 times a number
9.		7 decreased by 4 times a number
10.		9 less than twice a number
11.		9 decreased by twice a number
12.		9 less than half a number
13.		7 times a number, increased by 4
14.		7 times a number, increased by 4 times the number

H	$7 - 4x$
I	$2x - 9$
J	$7x + 4$
K	$4x - 7$
L	$7x + 4x$
M	$9 - 2x$
N	$\frac{x}{2} - 9$

15.		5 times a number, increased by 8
16.		5 times the sum of a number and 8
17.		5 more than 8 times a number
18.		8 times the sum of a number and 5
19.		twice the sum of 5 times a number and 8
20.		2 more than five-eighths of a number
21.		8 times the sum of twice a number and 5

O	$8(x + 5)$
P	$8(2x + 5)$
Q	$8x + 5$
R	$2(5x + 8)$
S	$5x + 8$
T	$5(x + 8)$
U	$\frac{5}{8}x + 2$

22.		9 meters higher than altitude x
23.		15 meters per second slower than speed x
24.		15 degrees hotter than temperature x
25.		9 meters shorter than twice length x
26.		9 years older than twice age x
27.		\$9 cheaper than 4 times price x
28.		9 centimeters less than three-fourths of length x

V	$x + 15$
W	$x + 9$
X	$4x - 9$
Y	$2x - 9$
Z	$2x + 9$
AA	$x - 15$
BB	$\frac{3}{4}x - 9$

A	Commutative Property of Addition	The order in which numbers are added does not change the sum.	$5 + 3 = 3 + 5$
B	Commutative Property of Multiplication	The order in which numbers are multiplied does not change the product.	$2 \cdot 4 = 4 \cdot 2$
C	Associative Property of Addition	The way in which addends are grouped does not change the sum.	$(2 + 4) + 6 = 2 + (4 + 6)$
D	Associative Property of Multiplication	The way in which factors are grouped does not change the product.	$(3 \cdot 5) \cdot 7 = 3 \cdot (5 \cdot 7)$
E	Identity Property of Addition	The sum of an addend and zero is the addend.	$7 + 0 = 7$
F	Identity Property of Multiplication	The product of a factor and one is the factor.	$9 \cdot 1 = 9$
G	Multiplicative Property of Zero	The product of a factor and zero is zero.	$5 \cdot 0 = 0$
H	Distributive Property	The sum of two addends multiplied by a number is the sum of the product of each addend and the number.	$4 \cdot (7 + 2) = 4 \cdot 7 + 4 \cdot 2$

Name the property shown by each statement. You may write the letter listed for your answer.

1.	$4 + (9 + 6) = (4 + 9) + 6$		2.	$5 + 12 = 12 + 5$	
3.	$(3 + 6) + 0 = 3 + 6$		4.	$(3 + 4) + 5 = 3 + (4 + 5)$	
5.	$(15 + 7) + 2 = 2 + (15 + 7)$		6.	$13 \cdot 1 = 13$	
7.	$14 \cdot 8 = 8 \cdot 14$		8.	$(3 + 5) + 9 = 3 + (5 + 9)$	
9.	$(2 \cdot 5) \cdot 0 = 0$		10.	$6 \cdot (8 + 2) = (8 + 2) \cdot 6$	
11.	$6 \cdot (4 \cdot 3) = (6 \cdot 4) \cdot 3$		12.	$(3 \cdot 9) \cdot 1 = 3 \cdot 9$	
13.	$(15 + 11) + 4 = 4 + (15 + 11)$		14.	$(1 + 2) \cdot 5 = (2 + 1) \cdot 5$	
15.	$(5 \cdot 6) \cdot 7 = (6 \cdot 5) \cdot 7$		16.	$(7 + 3) \cdot 5 = (3 + 7) \cdot 5$	

“WHEN WILL I EVER USE THIS IN REAL LIFE?”

Honestly, you may never end up using this again in life.

Almost all the math that most people need in life, they learn before they get to Algebra. But one thing you need to understand is that we don't study upper-level math because we will be using it every day.

You don't study World War II or the Civil War because you will grow up and be in a war. You study the reasons people go to war, and the outcomes of war, to learn how to prevent war.

You learn how to diagram a sentence in English so that you have a better grasp of proper writing skills.

Will you ever dissect a frog again? Probably not, but you do it in school to have a better understanding of the muscular, respiratory, and circulatory systems and how they work. By understanding how they work in a frog, you understand how they work in a human.

You study math to learn how to think. Being able to think through problems and decide on solutions to the problem is what you learn from math.

We use math because we are able to get immediate feedback to determine if our thought process was correct (did you solve the problem correctly?). We continue to study higher levels of math to challenge our thinking and to become more efficient problem solvers.

Will you ever use this again in life? I don't know, and you don't either. Who knows what you will do when you graduate from college, but why limit your options?

One thing is guaranteed: You will have to solve problems your entire life. Not necessarily math problems, but life problems. Some will be simple and some will be difficult.

You may already be prepared to handle simple ones, but my goal is to prepare you for the harder problems you will face in life. I hope to teach you the thinking skills you will need to approach those problems with confidence and solve them.

Now go back to your desk and learn to think.

(Taken from the Star-Telegram, December 24, 2002, Michael Yelvington, Grapevine HS)

Each type of fruit represents a single digit (0-9). Using what you know about the number system, determine the value of each fruit.

$$\begin{array}{r} \text{lemon} \\ + \text{cherries} \\ \hline \text{cherries} \end{array}$$

$$\begin{array}{r} \text{grapes} \\ \times \text{grapes} \\ \hline \text{strawberry} \end{array}$$

$$\begin{array}{r} \text{banana} \\ + \text{banana} \\ \hline \text{oranges} + \text{banana} \end{array}$$

$$\begin{array}{r} \text{cherries} \\ - \text{apple} \\ \hline \text{grapes} \end{array}$$

$$\begin{array}{r} \text{grapes} \\ + \text{grapes} \\ \hline \text{watermelon} \end{array}$$

$$\begin{array}{r} \text{watermelon} \\ \times \text{oranges} \\ \hline \text{watermelon} \end{array}$$

$$\begin{array}{r} \text{cherries} \\ \times \text{grapes} \\ \hline \text{pear} + \text{oranges} \end{array}$$

$$\frac{\text{oranges} + \text{lemon}}{\text{pear}} = \text{banana}$$

$$\frac{\text{pineapple}}{\text{pear}} = \text{apple}$$

What single-digit number do \square and \triangle each represent in the expressions below?

$$\square + \square = \triangle \times \triangle$$

$$\square + \square + \square + \square = \square \times \triangle$$

What single-digit numbers do \square , \triangle , and \bigcirc represent in the expression below?

$$\square - \triangle = 3$$

$$\bigcirc \times \triangle = 30$$

$$\bigcirc + \triangle + \square = 20$$

Equations Vocabulary

Coefficient	A coefficient is the number that you multiply a variable by.	$4x = 12$ 4 is the coefficient
Variable	A variable is a letter that stands for an unknown amount.	$4x = 12$ x is the variable
Constant	A constant is a number that is all by itself (it is not multiplied or divided by a variable).	$4x = 12$ 12 is the constant
Term	A term is one of the quantities connected by an addition or subtraction sign in an equation. A term is a number, a variable, or the product or quotient of a number and a variable.	$4x = 12$ 4x is the term

Solve each equation mentally.

1.	$8c = 24$		2.	$14 - 10 = y$		3.	$24 = 16 + b$	
4.	$8 = \frac{x}{5}$		5.	$\frac{z}{15} = 2$		6.	$30 = 3w$	
7.	$32 + p = 50$		8.	$\frac{r}{7} = 10$		9.	$21 - d = 5$	
10.	$x + 13 = 22$		11.	$\frac{m}{5} = 20$		12.	$72 = 9k$	
13.	$t - 25 = 25$		14.	$5m = 0$		15.	$12 + a = 29$	
16.	$33 - h = 13$		17.	$44 = p - 1$		18.	$\frac{n}{8} = 0$	
19.	$10 + q = 10$		20.	$66 - 33 = f$		21.	$\frac{t}{7} = 7$	
22.	$\frac{u}{15} = 1$		23.	$36 - k = 0$		24.	$\frac{28}{x} = 4$	
25.	$48 = t - 2$		26.	$17 = r + 7$		27.	$8 = \frac{32}{s}$	

Example

$$d - 42 = 13$$

What are we trying to solve for? d

So we need to get d on one side of the equation all by itself. How?

We can add 42 to both sides. According to the addition property of equality the two sides will remain equal.

$$\begin{aligned} d - 42 &= 13 \\ +42 &= +42 \\ d &= 55 \end{aligned}$$

To check the solution, plug the answer back into the original equation.

$$\begin{aligned} d - 42 &= 13 \\ 55 - 42 &= 13 \\ 13 &= 13 \checkmark \end{aligned}$$

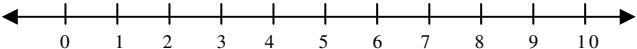
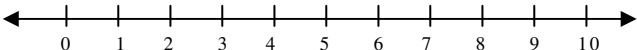
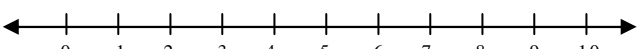
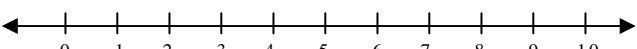
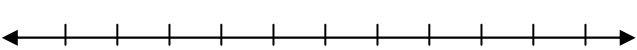
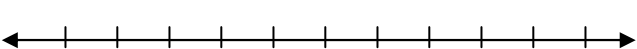

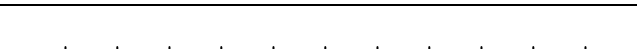
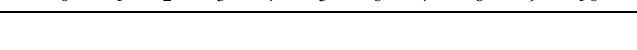
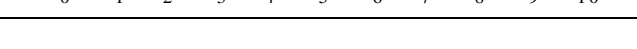
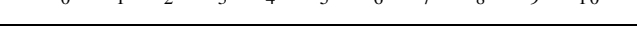
Solve each problem directly below each equation. In the space to the right of the equation check your solution.

1.	$x - 35 = 62$	Check:	2.	$y + 16 = 47$	
3.	$z - 12 = 52$		4.	$a - 22 = 13$	
5.	$16 = s + 9$		6.	$12 = t - 4$	
7.	$22 = c - 12$		8.	$34 = d + 16$	
9.	$20 + n = 40$		10.	$p - 75 = 156$	
11.	$s + 71 = 156$		12.	$y - 15 = 72$	

Solve each problem showing all steps on a separate sheet of paper. Check your solution showing all steps. Write only your solution in the box on this page.

1.	$12 + n = 16$		2.	$14 + q = 36$	
3.	$r - 18 = 36$		4.	$f = 8.6 + 9.7$	
5.	$846 = n - 37$		6.	$947 = p - 43$	
7.	$g - 6.3 = 9.5$		8.	$h - 3.7 = 6.8$	
9.	$125 + y = 250$		10.	$q = 387 + 221$	
11.	$7.36 + w = 8.94$		12.	$2.17 + k = 4.19$	

Solve each equation and check your solution showing all work on a separate sheet of paper. Then graph the solution on the number line.

13.	$m + 7 = 12$		
14.	$x - 6 = 3$		
15.	$y + 11 = 15$		
16.	$14 = y + 8$		
17.	$11 = t + 16$		
18.	$n - 3 = 4$		
19.	$13 = z + 18$		
20.	$z + 6 = 15$		
21.	$m + 14 = 17$		
22.	$5 = c - 3$		
23.	$0 = j - 4$		

Example $5d = 30$ What are we trying to solve for? d So we need to get d on one side of the equation all by itself. How?

We can divide both sides by 5. According to the division property of equality the two sides will remain equal.

$$\frac{5d = 30}{5 = 5}$$

$$d = 6$$

To check the solution, plug the answer back into the original equation.

$5d = 30$

$5(6) = 30$

$30 = 30 \checkmark$

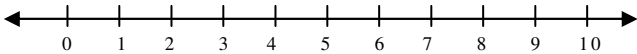
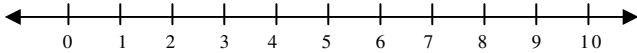
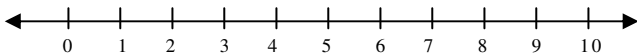
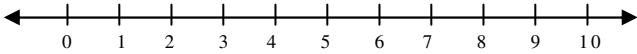
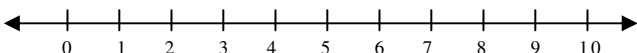
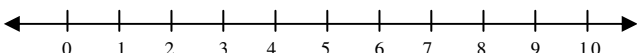
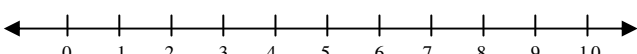
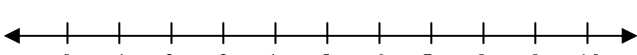
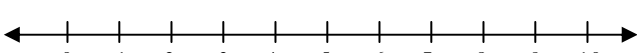
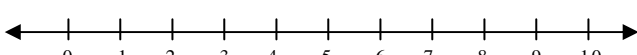
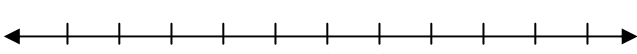
Solve each problem directly below each equation. In the space to the right of the equation check your solution.

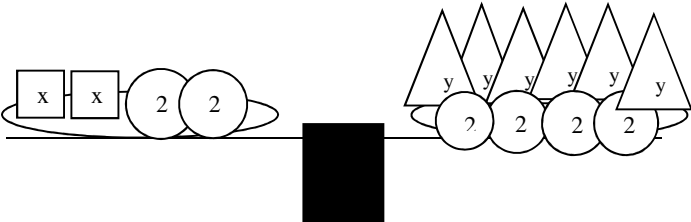
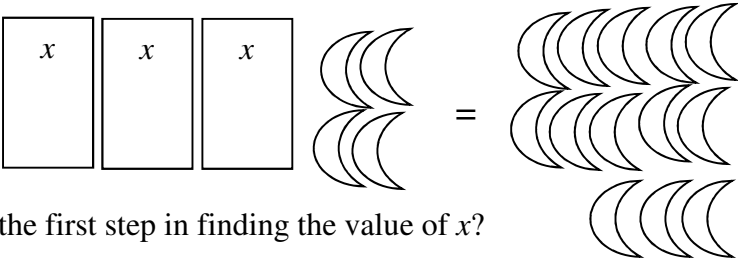
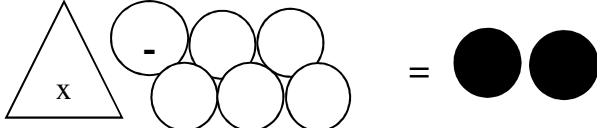
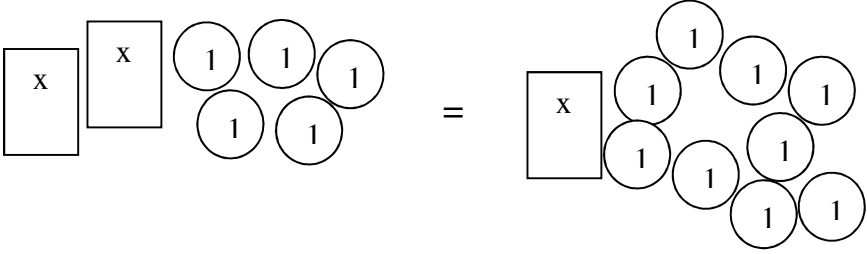
1.	$12x = 36$	Check:	2.	$8y = 96$	
3.	$54 = 9w$		4.	$\frac{a}{3} = 15$	
5.	$48 = 6y$		6.	$\frac{b}{7} = 21$	
7.	$19z = 171$		8.	$\frac{a}{12} = 16$	
9.	$\frac{c}{9} = 21$		10.	$\frac{s}{6} = 12$	
11.	$21d = 147$		12.	$\frac{a}{25} = 5$	

Solve each problem showing all steps on a separate sheet of paper. Check your solution showing all steps. Write only your solution in the box on this page.

1.	$63f = 945$		2.	$\frac{h}{0.3} = 19$	
3.	$\frac{k}{2.7} = 21$		4.	$\frac{m}{18} = 39$	
5.	$8.34x = 25.02$		6.	$12y = 276$	
7.	$34t = 85$		8.	$5.25a = 21$	
9.	$\frac{x}{1.8} = 72$		10.	$\frac{n}{5} = 16.4$	

Solve each equation and check your solution showing all work on a separate sheet of paper. Then graph the solution on the number line.

11.	$12 = 4t$		
12.	$1.5x = 9$		
13.	$28 = 7f$		
14.	$1 = \frac{n}{5}$		
15.	$2 = \frac{k}{2}$		
16.	$0 = \frac{y}{36}$		
17.	$1 = \frac{m}{3}$		
18.	$4x = 12$		
19.	$12p = 48$		
20.	$3 = \frac{t}{1}$		
21.	$9r = 27$		

<p>1.</p>	<p>The model represents the equation $2x + 4 = 6y + 8$.</p>  <p>What is the value of x?</p> <p>A. $x = 3y$ B. $x = 4y + 4$ C. $x = 3y + 4$ D. $x = 3y + 2$</p>	
<p>2.</p>	<p>The model below represents the equation $3x + 4 = 13$.</p>  <p>What is the first step in finding the value of x?</p> <p>A. Divide the bananas equally among the 3 cups. B. Add 13 bananas to each side of the model. C. Add 4 bananas to each side of the model. D. Subtract 4 bananas from each side of the model.</p>	
<p>3.</p>	<p>The model represents the equation $x - 6 = 2$.</p>  <p>What is the value of x?</p> <p>A. $x = 3$ B. $x = 4$ C. $x = 8$ D. $x = 12$</p>	
<p>4.</p>	<p>The equation $2x + 5 = x + 9$ is modeled below. What value of x makes the equation true?</p>  <p>A. $x = 7$ B. $x = 6$ C. $x = 12$ D. $x = 4$</p>	

Define a variable. Then write an equation for each problem, solve and check. The variable should not be all by itself in the original equation. Show all work on a separate sheet of paper.

1.	The Sears Tower in Chicago has a height of 1,454 ft. This is 408 ft taller than the Chrysler Building in New York City. What is the height of the Chrysler Building?	Equation:
		Answer:
2.	The population of Los Angeles in 1990 was about 1.7 times the population of Chicago. The population for Los Angeles was 11.9 million. What was the population of Chicago?	Equation:
		Answer:
3.	Chris spends one-fourth of his monthly income on car insurance. His monthly car insurance is \$105. What is his monthly income?	Equation:
		Answer:
4.	One-third of the problems on the next math test are multiple choice. The test contains 12 multiple-choice problems. How many problems are on the test?	Equation:
		Answer:
5.	The total bill for a DVD is \$25.44 including tax. The tax is \$1.44. What is the marked price of the disk?	Equation:
		Answer:
6.	There are 6 peaches in each container. How many containers are needed to have exactly 78 peaches?	Equation:
		Answer:
7.	You are 3 inches taller than you were last year. Last year you were 60 inches tall. How tall are you now?	Equation:
		Answer:
8.	A prime rib dinner at a restaurant costs \$21.95. A chicken dinner is \$7 cheaper. What is the cost of the chicken dinner?	Equation:
		Answer:
9.	Students were getting ready to play a game. After dividing the students into 6 even groups, there were 14 students in each group. How many total students were there?	Equation:
		Answer:
10.	Write two word problems on a separate sheet of paper that are more interesting than the ones above. Each word problem should require a one-step equation to solve. Write the equation and answer to each.	