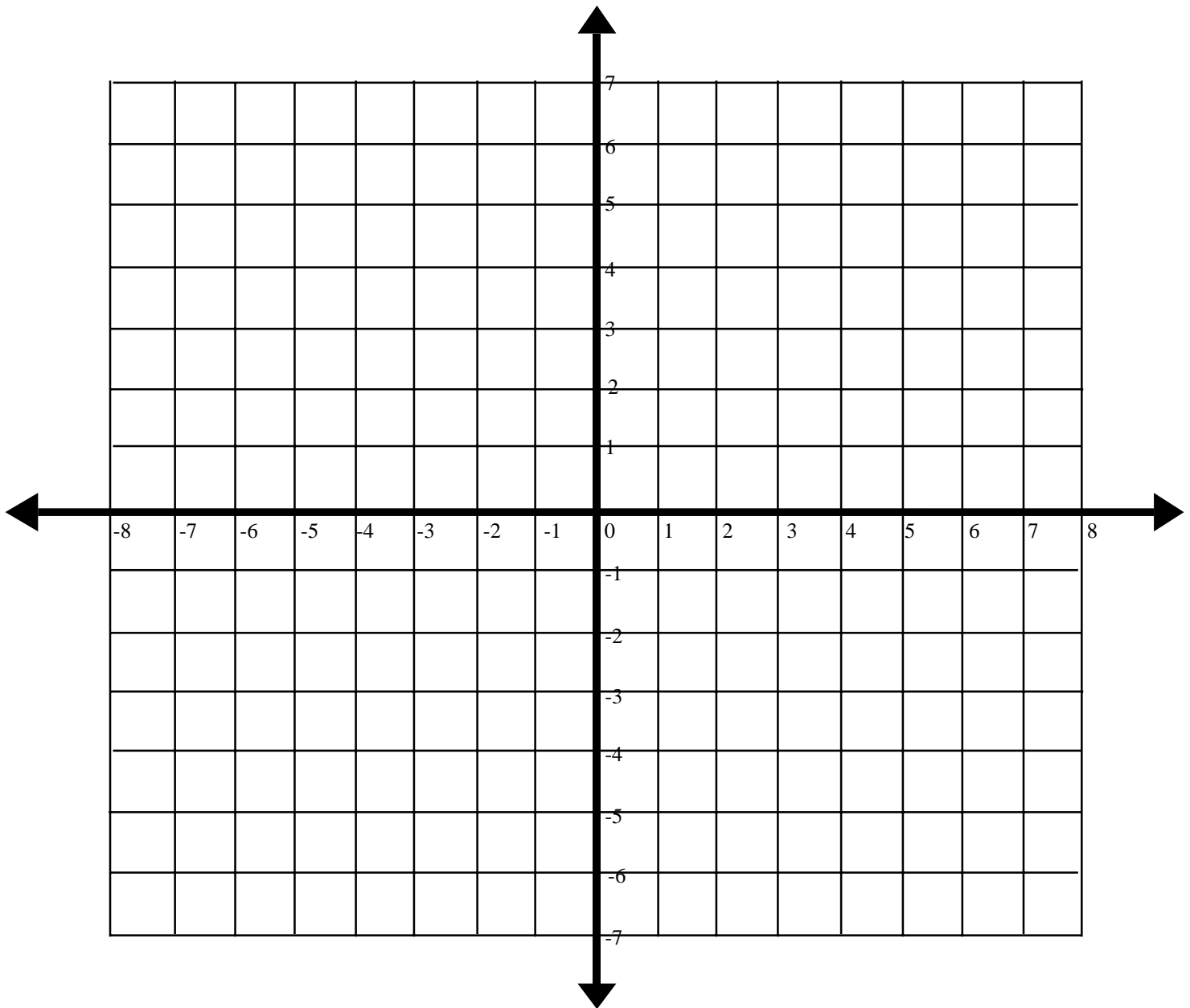


Four in a Row



Algebraic Expression

Suggested expressions: $x + y$ $x - y$ $-x + 2y$ $x^2 - y$ $-(x + y)$ $2x - 3y$ $y + \frac{1}{x}$

Asian Passport Spinners

Asian Passport Stamps

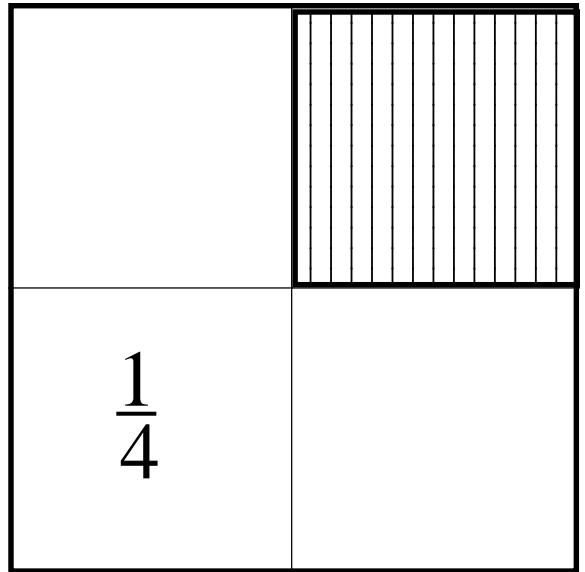
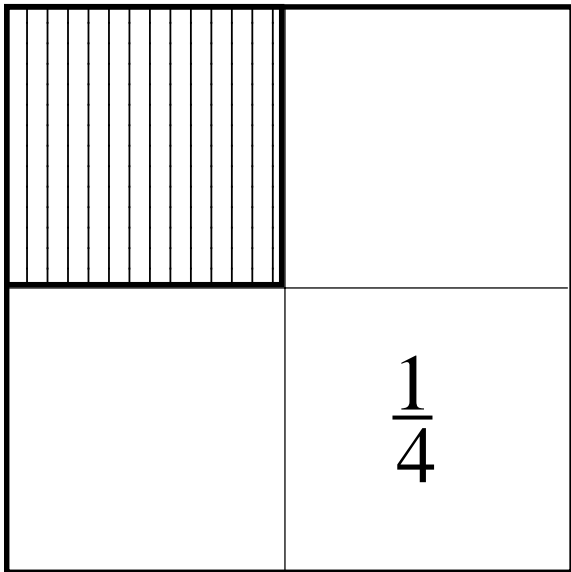
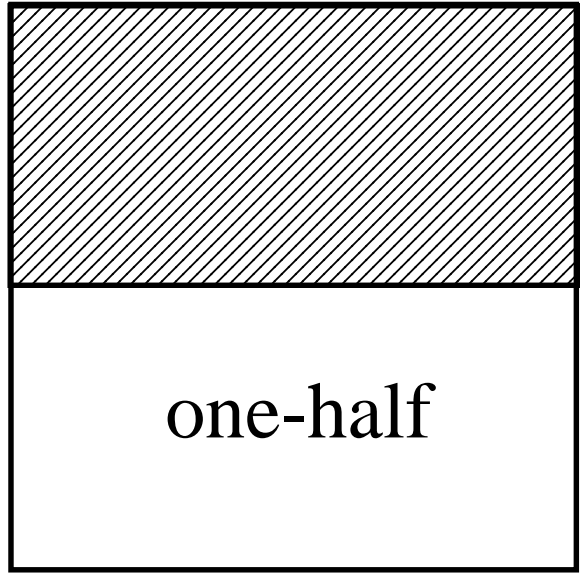
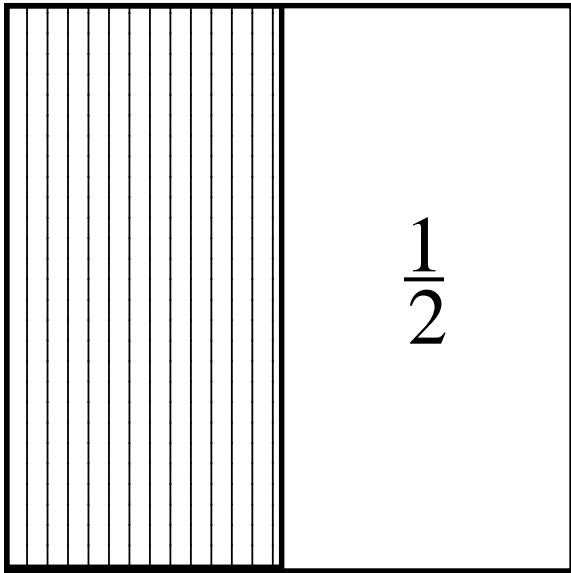
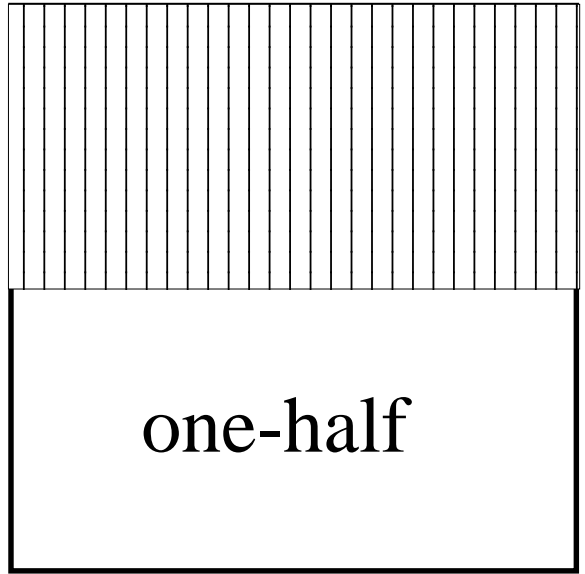
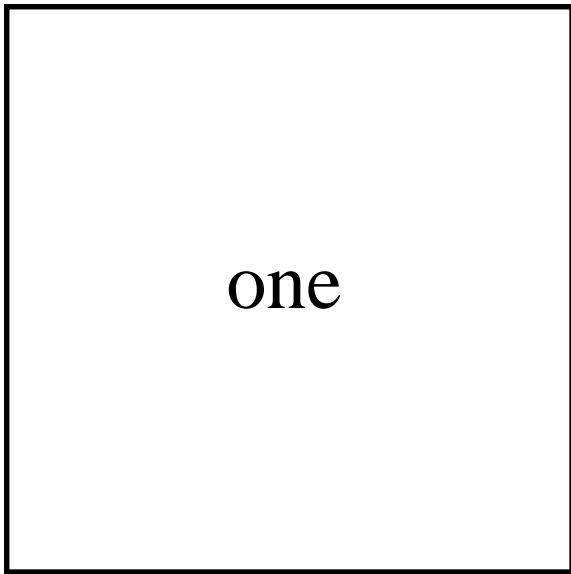
List eight countries that you would like to visit in Asia. Japan has already been listed. You will use these nine countries to create spinners to simulate the chance that the countries are visited and you would receive a stamp in your passport.

- | | | |
|----------|----|----|
| 1. Japan | 2. | 3. |
| 4. | 5. | 6. |
| 7. | 8. | 9. |

Create a spinner so that each of the countries above has an equally likely chance of being visited. How many sections will your spinner have? What is the angle measure of each central angle? Set up a proportion to get the angle measure. Use a protractor to draw the spinner.

If you wanted to create a spinner for the nine countries, but you wanted Japan to be twice as likely to be the country you visit, how many degrees would you make the central angle for Japan? Use a proportion to find the angle measure. Use a protractor to draw the spinner.

Suppose you really wanted to visit Japan. Create a spinner so that Japan has a four times greater chance of being the country you visit. What will the central angle measurement for Japan be? Set up a proportion to find this angle measure. Use a protractor to draw the spinner.



Gulliver's Travels

The following is an excerpt from the book, *Gulliver's Travels*, by Jonathan Swift. Gulliver is shipwrecked and swims to the island of Lilliput. There he finds the Lilliputians, who have an average height of less than six inches. Because Gulliver was shipwrecked, he did not have any clothes, therefore, the Lilliputians made him some.

“The seamstresses took my measure as I lay on the ground, one standing at my neck, and another at my mid-leg, with a strong cord extended, that each held by the end, while the third measured the length of the cord with a rule of an inch long. Then they measure my right thumb, and desired no more; for by a mathematical computation, that twice round the thumb is once round the wrist, and so on to the neck and the waist; and by help of my old shirt, which I displayed on the ground before them for a pattern, they fitted me exactly.”

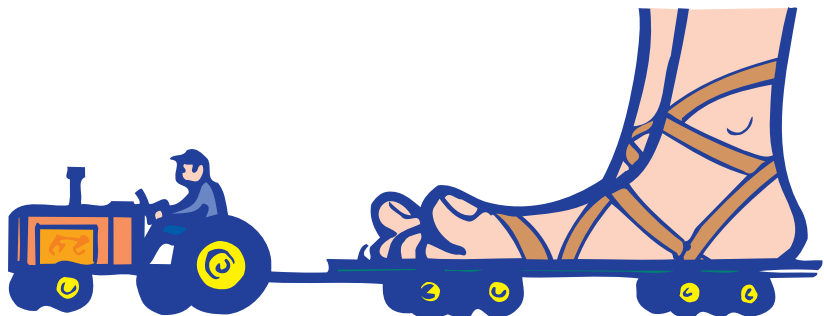
1. What two measurements did the Lilliputians take in order to make a shirt for Gulliver? Why did they only need to take two?
2. What does Gulliver mean by “twice round the thumb is once round the wrist”?
3. What does Gulliver mean by “and so on to the neck and waist”?

Using Ratios to Predict

Can the ratios used by the Lilliputians be used to accurately predict your own body measurements?

Directions:

1. In Cooperative Pairs, one person will cut a piece of string equal to the distance around their wrist.
2. Wrap this string around the base of your thumb as many times as you can. Record results.
3. Repeat with the other partner.



Analyze your results using the following questions:

1. About how many times did the string go around your thumb?
2. About how many times did the string go around your partner's thumb?
3. Did you and your partner get the same results?
4. Will the rest of your class get the same results?
5. Does your answer support Gulliver's claim that "twice around the thumb is once around the wrist"?
6. If the distance around a person's thumb is 6cm, what do you expect the distance around the wrist to be?
7. Write the measurements from #6 (using 6cm) as a ratio in three different ways.
8. Take the fraction from #7 and write it as a decimal.

Extension:

Continue the body ratios that Gulliver mentions and finish the chart. Do Gulliver's ratios make sense? Are they close to your ratios?

Body Ratio	Gulliver's Ratio		Your Actual Ratio	
	Fraction	Decimal	Fraction	Decimal
<u>Distance around Thumb</u> Distance around the Wrist				
<u>Distance around the Wrist</u> Distance around the Neck				
<u>Distance around the Neck</u> Distance around the Waist				

Four's A Winner!



99	270	50	198	165	132
66	70	280	110	21	60
10	11	9	30	40	80
6	120	90	200	3	75
33	5	12	13	180	160
18	20	240	133	15	45

$33\frac{1}{3}\%$ of	$33\frac{1}{3}\%$ increase	50% decrease
10% of	10% increase	50% increase
10	30	60
90	100	120
150	180	210

Investigating Patterns in Multiplying Integers**Part I:**

Answer each of the following problems.

- | | | | |
|-----------------|-----------------|--------------------|------------------|
| 1. $5 * 8 =$ | 2. $-3 * 4 =$ | 3. $-6 * -2 =$ | 4. $7 * -1 =$ |
| 5. $9 * 4 =$ | 6. $-5 * 12 =$ | 7. $-10 * -4 =$ | 8. $15 * -2 =$ |
| 9. $12 * 3 =$ | 10. $-9 * 9 =$ | 11. $-7 * -3 =$ | 12. $11 * -8 =$ |
| 13. $123 * 5 =$ | 14. $-84 * 3 =$ | 15. $-469 * -22 =$ | 16. $14 * -33 =$ |

Part II:

Fill in the blanks with the words “positive” or “negative” based on what you find in your investigation.

- A. Look back at problems 1, 5, 9, & 13. In each of these problems, the factors are both _____, and the product is _____.
- B. Look back at problems 2, 6, 10, & 14. In each of these problems, the first factor is _____ and the other is _____. The product is _____.
- C. Look back at problems 3, 7, 11, & 15. In each of these problems, the factors are _____, and the product is _____.
- D. Look back at problems 4, 8, 12, & 16. In each of these problems, the first factor is _____ and the other is _____.

The product is _____.

Part III: Conclusions

What can you conclude, then?

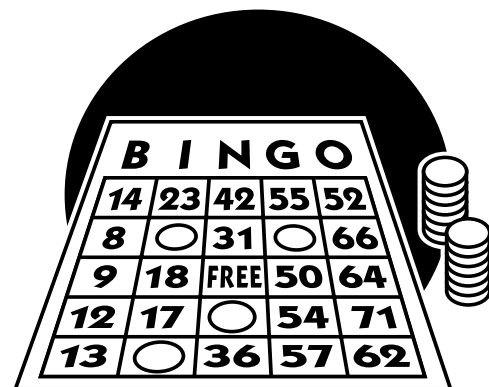
- A. If you multiply a positive by a positive, the product will be _____.
- B. If you multiply a positive by a negative, the product will be _____.
- C. If you multiply a negative by a positive, the product will be _____.
- D. If you multiply a negative by a negative, the product will be _____.

BONUS:

Explain why this is true.

Rational Math Bingo

B	I	N	G	O
-19	-18	-6	6	18
-20	-17	-5	7	19
-21	-16	-4	8	20
-22	-15	-3	9	21
-23	-14	-2	10	22
-24	-13	-1	11	23
-25	-12	0	12	24
-26	-11	1	13	25
-27	-10	2	14	26
-28	-9	3	15	27
-29	-8	4	16	28
-30	-7	5	17	29



Sara's Chocolate

Consider this situation:

Sara has half of a Hershey's bar in her pocket. Her two friends, Jabria and Kendra, want a piece of her chocolate. (note: there are three people total.)

Answer the following questions:

1. Would you expect the piece that Sara and her friends get to be a whole chocolate bar or a fraction of a piece? Why?
2. Write an expression you would use to solve the above situation.
3. Solve the expression. Does your answer match your expectation in #1?

Consider, this next situation:

Sara still has her half of a Hershey's bar. Now, her friends are saying that they are on a diet and they are only allowed to have one-fourth of a candy bar.

1. If Sara gives them one-fourth of the original Hershey's bar, do you expect that she will have enough for herself? Why or why not?
2. Write an expression you would use to solve the above situation.
3. Solve the expression. How does this compare with your expectation in #1?

Discussion:

Division is usually considered to produce smaller numbers. Is this always true?

1. Write an expression where two numbers are divided to produce a smaller number.
2. When will division produce a smaller number?
3. Write an expression where two numbers are divided to produce a larger number.
4. When will division produce a larger number?
5. How does your answer to #4 relate to Sara's situation?

Building Rectangles from Cubes

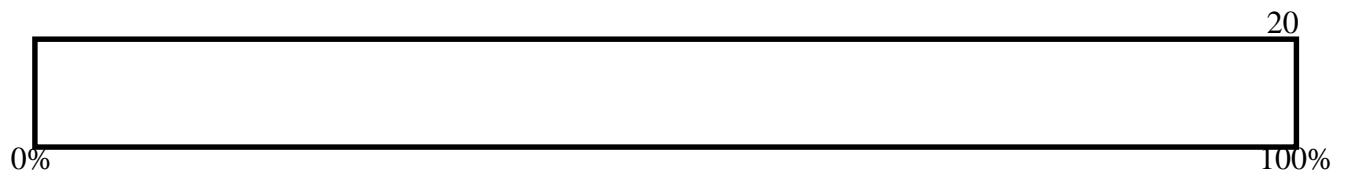
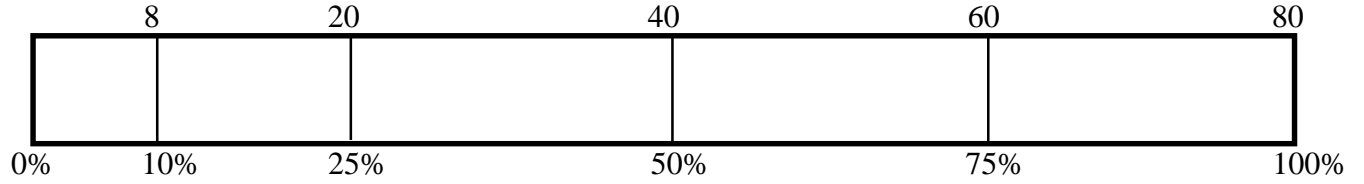
Materials needed: Enough colored cubes or color tiles for each group to have
6 red, 5 blue, 5 yellow, 5 green.
Graph paper and colored pencils for recording solutions.

Tasks

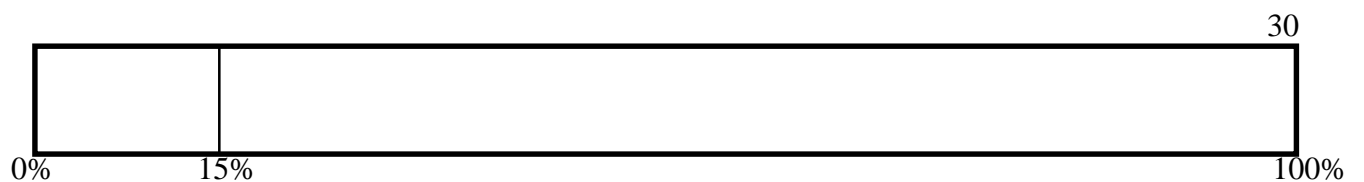
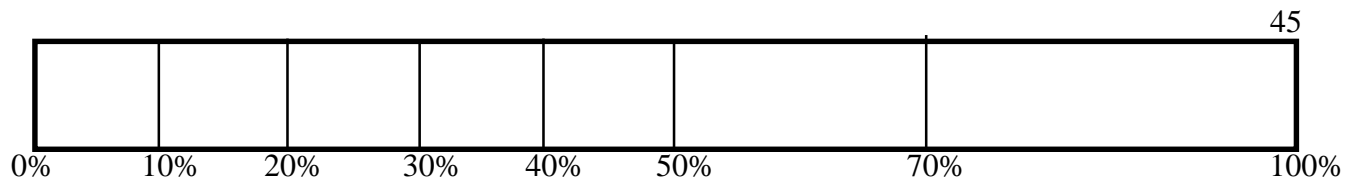
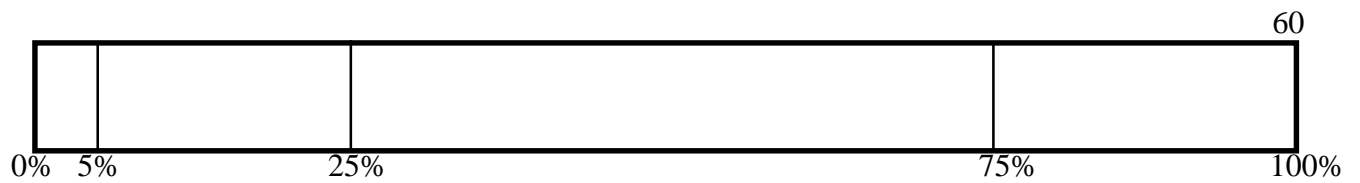
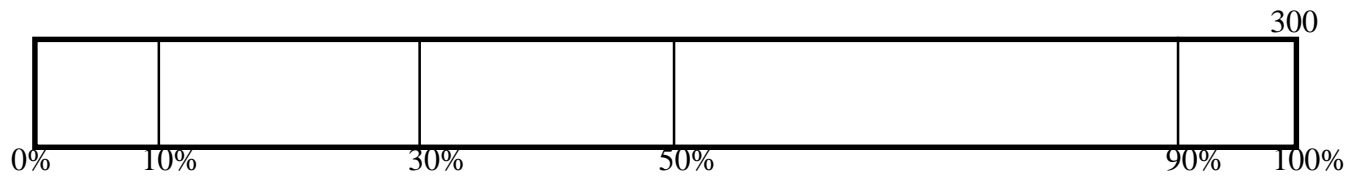
1. Build a rectangle that is half blue and half green. Can you do this in more than one way? Can you think of various ways to write the name of the rectangle you made? Draw a picture of each method and label it with the various forms of the fraction name.
2. Build a rectangle that is $\frac{1}{2}$ blue, $\frac{1}{4}$ green and the rest red. How many cubes did you use? Can you solve this problem another way? Draw a picture of the solutions you found. What fraction of the rectangle is red? Write a number sentence that shows how the different colors represent fractions that add up to one.
3. Build a rectangle that is $\frac{1}{3}$ blue, $\frac{1}{6}$ green and the rest red. How many cubes did you use? Can you solve this problem another way? Draw a picture of the solutions you found. What fraction of the rectangle is red? Write a number sentence that shows how the different colors represent fractions that add up to one.
4. Build a rectangle that is $\frac{1}{4}$ blue, $\frac{1}{8}$ green and the rest red. How many cubes did you use? Could you solve this problem another way if you had more cubes? Draw a picture of the solutions you found. What fraction of the rectangle is red? Write a number sentence that shows how the different colors represent fractions that add up to one.
5. Build a rectangle that is $\frac{1}{4}$ blue, $\frac{1}{2}$ red, $\frac{1}{3}$ green and the rest yellow. How many cubes did you use? Could you solve this problem another way if you had more cubes? Draw a picture of the solutions you found. What fraction of the rectangle is red? Write a number sentence that shows how the different colors represent fractions that add up to one.
6. Build a rectangle that is $\frac{3}{5}$ red, $\frac{1}{2}$ blue and the rest green. How many cubes did you use? Could you solve this problem another way if you had more cubes? Draw a picture of the solutions you found. What fraction of the rectangle is red? Write a number sentence that shows how the different colors represent fractions that add up to one.
7. Suppose you were to build a rectangle that is $\frac{3}{8}$ blue, $\frac{1}{4}$ green, $\frac{1}{3}$ red and the rest yellow. How many cubes would you need? Draw a picture of this rectangle and write the number sentence that shows how it is constructed.

Estimating With Percent Bars

Class examples:



Find the number that matches each percent on the percent bars below.



Investigating Operations Affect on Size

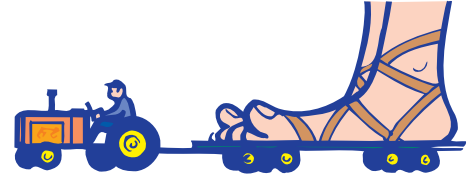
Fill in each blank.

Set I

- a. $5 + \underline{\hspace{1cm}} = 8$
- b. $11 + \underline{\hspace{1cm}} = 20$
- c. $-7 + \underline{\hspace{1cm}} = 3$
- d. $-9 + \underline{\hspace{1cm}} = -6$

Set II

- a. $6 + \underline{\hspace{1cm}} = 4$
- b. $12 + \underline{\hspace{1cm}} = 9$
- c. $-2 + \underline{\hspace{1cm}} = -5$
- d. $4 + \underline{\hspace{1cm}} = -1$



1. Analyze the problems in Set I. In each case, the sum was _____ than the first addend.
(larger/smaller)
2. Look at each of your answers in Set I. Were the numbers positive or negative?
3. Analyze the problems in Set II. In each case, the sum was _____ than the first addend.
(larger/smaller)
4. Look at each of your answers in Set II. Were the numbers positive or negative?
5. When a positive number is added to any number what happens? _____

6. When a negative number is added to any number, what happens? _____

7. What would you say to someone who argued that adding will always result in larger numbers?

8. Create some subtraction problems. Do you think that subtracting will always make numbers smaller?
Why (not)? _____

Set III

a. $2 \cdot \underline{\quad} = 8$

b. $4 \cdot \underline{\quad} = 20$

c. $14 \div \underline{\quad} = 7$

d. $9 \div \underline{\quad} = 3$

9. Analyze problems a and b in Set III. In each case, the product was _____ than the first factor.
(larger/smaller)

In problems c and d, the quotient was _____ than the dividend.
(larger/smaller)

10. Look at each of your answers in Set III. Were your answers whole numbers?

11. When a whole number is multiplied by any number what happens? _____

12. When any number is divided by a whole number, what happens? _____

13. Analyze problems a and b in Set IV. In each case, the product was _____ than the first factor.

(larger/smaller)

In problems c and d, the quotient was _____ that the dividend.
(larger/smaller)

14. Look at each of your answers in Set IV. Were your answers whole numbers?

15. When a rational number less than one is multiplied by any number what happens?

16. When any number is divided by a rational number less than one, what happens?

Four friends went out for dinner.
The total bill for dinner was
\$32.76. About how much does
each person owe for dinner and the
tip?



Situation 1

Solution: about \$16.00

Latisha found a shirt that is
regularly \$31.89 on sale for
30% off. She has \$50.00 and
wants to buy the shirt that is on
sale and a necklace that is
\$23.85. Does she have enough
money to purchase both?



Situation 2

Solution: Yes, she has enough

Toothpaste comes in different size tubes. You
can purchase a 6 oz. tube for \$1.32, a 10 oz.
tube for \$1.98, or a 15 oz. tube for \$3.75.
Which is the best buy for your money?



Situation 3

Solution: the 10 oz. tube

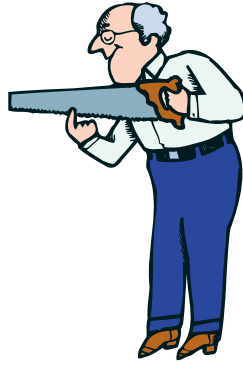
The Paw Print printing company wants to
increase hourly production of their T-shirts by
exactly 50%. They currently produce
168 T-shirts each hour. How many will they
produce with the 50% increase?



Situation 4

Solution: 336 t-shirts

Kadeem has a 5 ft. board he will cut to make wooden nametags. If each nametag needs to be one-third of a foot long, how many name tags can he cut?



Situation 5

Solution: 8 nametags

Antonio tracks the daily progress of a stock he has purchased. This is what he has observed over the past eight days: +5.5, -0.3, -3.7, +5.8, -6.4, -1.9, -0.5, and +5.4. Over the last eight days, does his stock show a net gain or loss?



Situation 6

Solution: a net loss

Jamie gets a car loan for \$24,000 at 5% interest for 5 years. If she budgets \$300.00 each month for her car payment, will she have enough to cover the loan?



Situation 7

Solution: yes

Barbara currently has a vineyard that is 12 meters by 10 meters. She wants more space and decides to double each dimension. How much space will she have in her new vineyard?



Situation 8

Solution: 240 m²

Four In A Row

-24	-20	-18	-16	-15	free
-12	-10	-9	-8	-6	-5
free	-4	-3	-2	-1	1
2	3	4	5	6	8
9	10	12	15	16	18
20	24	free	25	30	36

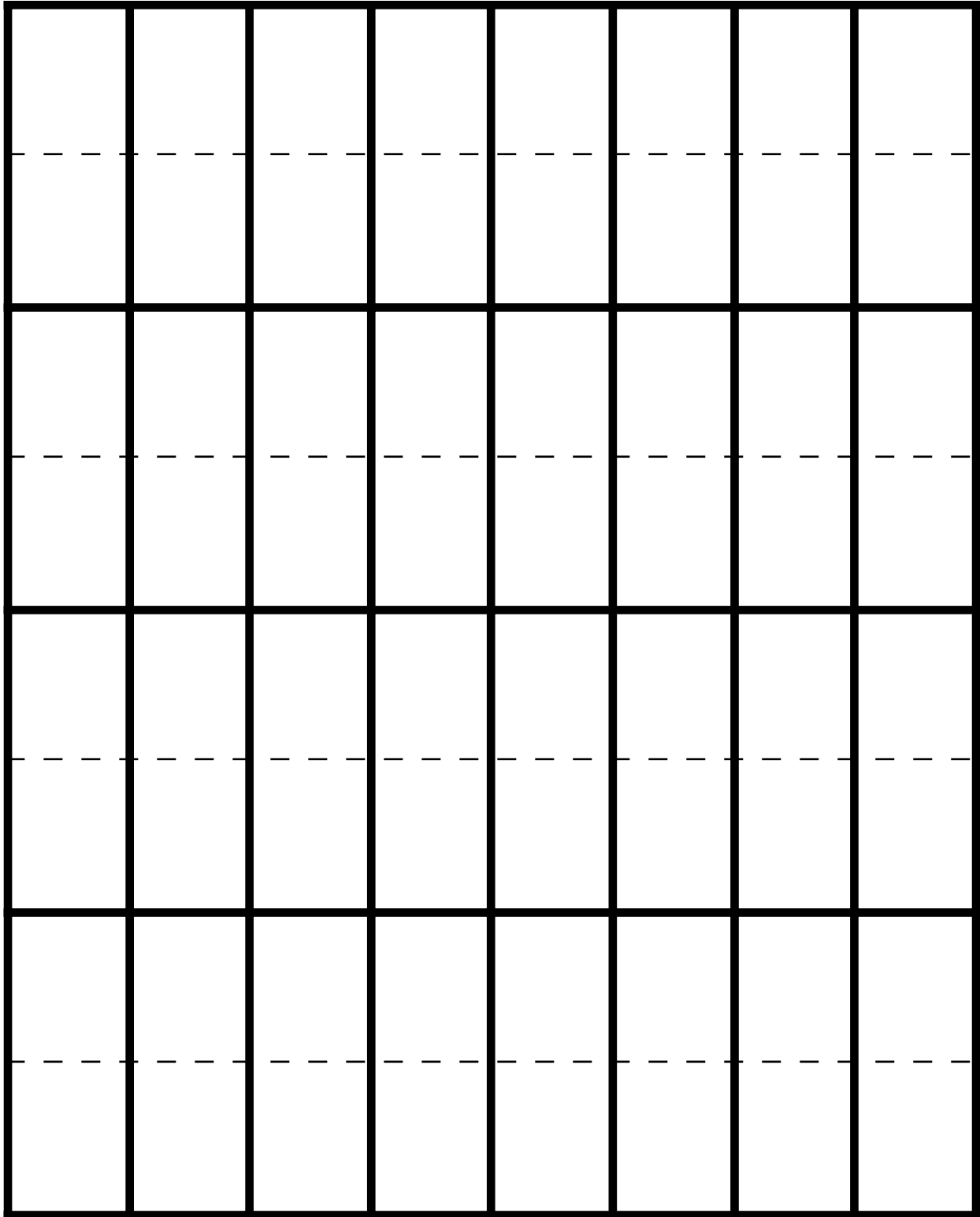
To play *Four in a Row*, you will need markers of two different shapes or colors and two paper clips. Play begins by the first player placing the two paper clips on any pair of factors along the bottom edge of the game board. The player then places a marker on the square which is the product of the two factors. The next player is allowed to move exactly **ONE** clip and cover the square which is the product of the two indicated factors. (Both clips can be placed on the same factor to square that factor.) Play alternates until someone gets four markers in a row, horizontally, vertically, or diagonally.

-6 -5 -4 -3 -2 -1 1 2 3 4 5 6

BEGIN	4(-2)	-8	(-1)(5)	-5	5(2)	10	(-3)(-4)
12	(2)(-3)	-6	0(3)	0	(1)(-1)	-1	(2)(-1)
-2	(-4)(1)	-4	(-1)(-5)	5	(-3)(-1)	3	(2)(2)
4	(2)(3)	6	(-4)(-2)	8	(3)(3)	9	(-3)(3)
-9	(-2)(5)	-10	(-2)(6)	-12	2(-8)	-16	(-4)(-4)
16	(1)(2)	2	5(-3)	-15	3(5)	15	(-3)(-6)
18	(-2)(9)	-18	(-4)(25)	-100	10(-2)	-20	(5)(5)
25	(-10)(-10)	100	4(5)	20	5(-5)	-25	END

Lining Up Dominoes

Lining Up Dominoes
Master Sheet



Pictorially Proportional

George bought six identical pairs of jeans for a total of \$240 not including tax.

How much would four pairs of jeans cost?

What about 20 pairs?

The Gap
10-03-2002

*Jeans _____
 *Jeans _____
 *Jeans _____
 *Jeans _____
 *Jeans _____
 *Jeans _____

Subtotal \$240.00
Tax _____
Total _____

Sam has to work five weeks to save a total of \$240.

\$

\$

\$

\$

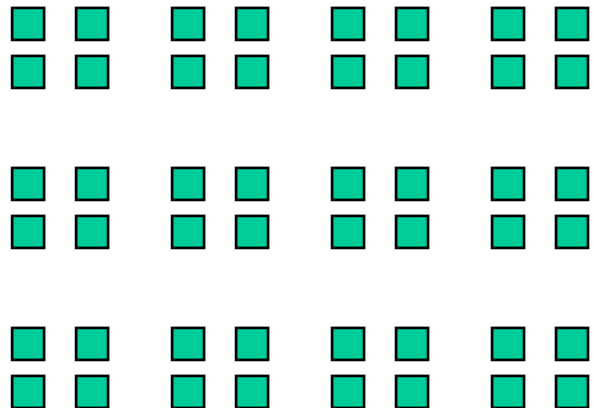
\$

How long will he have to work to save a total of \$480? \$60?

At the end of 21 days, a company has received 270 complaints. How many complaints can they expect during the next week? the next eight weeks?

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

In a restaurant with 16 tables, five waiters are required for the night shift. How many waiters are needed if the restaurant expands to 48 tables? 480 tables?



I Have ... Who Has ...

I Have -10	Who has my number in- creased by 3	I Have -7	Who has my number de- creased by 5
I Have -12	Who has my number plus -8	I Have -20	Who has my number minus -4
I Have -16	Who has my number plus 20	I Have 4	Who has my number plus -30
I Have -26	Who has my number plus -2	I Have -28	Who has my number minus -13
I Have -15	Who has my number minus 8	I Have -23	Who has my number plus 30
I Have 7	Who has my number plus -5	I Have 2	Who has my number plus -21
I Have -19	Who has my number minus 8	I Have -27	Who has my number minus -13
I Have -14	Who has my number plus -16	I Have -30	Who has my number in- creased by 30

I Have 0	Who has my number de- creased by 50	I Have -50	Who has my number in- creased by 60
I Have 10	Who has my number in- creased by 15	I Have 25	Who has my number plus -20
I Have 5	Who has my number plus 17	I Have 22	Who has my number plus 22
I Have 44	Who has my number minus -6	I Have 50	Who has my number plus 10
I Have 60	Who has my number de- creased by 20	I Have 40	Who has my number plus -14
I Have 26	Who has my number minus 27	I Have -1	Who has my number plus 13
I Have 12	Who has my number plus -22	I Have	Who Has
I Have	Who Has	I Have	Who Has

One-Centimeter Graph Paper

