Math 3 Classwork 17

Warm Up

1 Calculate (remember about the order of operations):

4 × 5 + 5 × 6 =

70 – 2 × 8 – 24 ÷ 6 =

46 + 11 × 4 – 30 ÷ 5 =

36 ÷ 12 + 48 ÷ 12 =

2 Place value. Rewrite each number, follow the example.

1,111 = 1,000 + 100 + 10 + 1

2, 321 =

807 =

6,002 =

3 Find the missing numbers to make an equality correct:

15 × 2 = 5 × ____

12 × ____ = _____ × 24

14 × 4 = 8 × _____

15 × 4 = 10 × ____

25 × ____ = 10 × 10

25 × 3 = 5 × _____

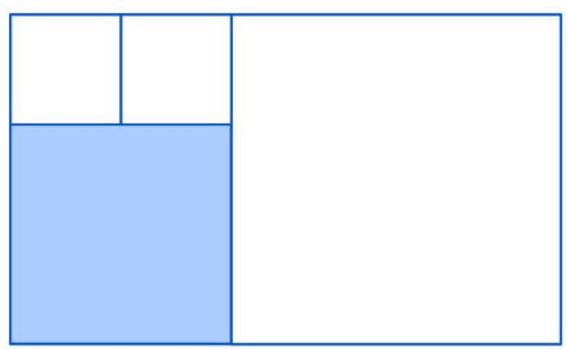
Homework Review

4 Rectangle is divided in 4 squares. Find a perimeter of a rectangle if one side of the shaded square is 6cm. Find the length and width of the rectangle first.

Length = ______________________________

Width = ______________________________

P = ______________________________



5 Calculate, follow the order of operations:

$$24 \overset{6}{:} 3 \overset{7}{-} (3 \overset{4}{+} 5 \overset{3}{\cdot} 2 \overset{5}{-} (10 \overset{1}{:} 2 \overset{2}{+} 1) = \ldots$$

a) 200 – 80 ÷ 5 + 3 × 4 = ____________________________________

b) 4 × 8 + 42 ÷ 6 × 5 = ______________________________________

c) 63 + 100 ÷ 4 – 8 × 0 = ____________________________________

d) 72 × 10 – 64 ÷ 2 ÷ 4 = ____________________________________

New Material I

Area and units of area

Perimeter measures the distance around the shape, to calculate a perimeter, we simply add the lengths of all sides of a polygon.

Area is a measure of how much surface is covered by a particular object or figure.

The square with a side of one unit is used as a unit of measure for area.

Every unit of **length** has a corresponding unit of area.
Thus, areas can be measured in square meters (m^2), square centimeters (cm^2), square millimeters (mm^2), square kilometers (km^2), square feet (ft^2), square yards (yd^2), square miles (mi^2), and so forth.

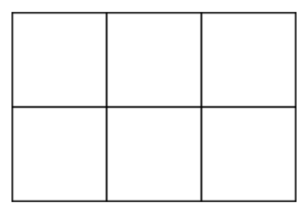
All the dimensions must be in the same units.

6

Two sheets of paper have twice the area of a single sheet, because there is twice as much space to write on.

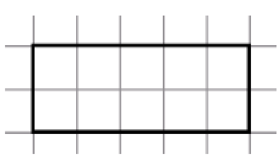
Different shapes have different ways to find the area. For example, in a rectangle we find the area by multiplying the length times the width. In the rectangle on the right, the area is 2×3 or 6. If you count the small squares you will find there are 6 of them.

a) $2 \times 3 = 6$ b) $3 \times 2 = 6$



7

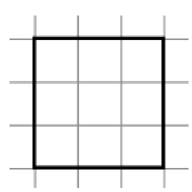
a.



____ × ____ = _______

A = ______ square units.

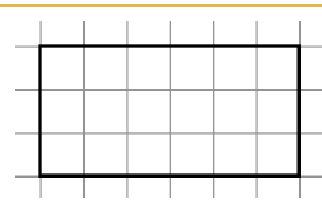
b.



____ × ____ = _______

A = ______ square units.

c.



____ × ____ = _______

A = ______ square units.

c. The area is ______ square units. **d.** The area is ______ square units.

REVIEW I

Commutative and Associative properties of addition

The commutative property: When two numbers are added, the sum is the same regardless of the order of the addends. For example: $3 + 5 = 5 + 3$ or $\boldsymbol{a + b = b + a}$
The property works for any number of addends.
The associative property: When three or more numbers are added, the sum is the same regardless of grouping of the addends. For example: $(3 + 5) + 1 = 3 + (5 + 1)$ or $\boldsymbol{(a + b) + c = a + (b + c)}$

8 Calculate by most optimal way. (Hint: use a commutative property of addition)

$(200 + 198 + 196 + \ldots + 2) – (1 + 3 + 5 + \ldots + 199) =$ ___________________

____

Commutative and Associative properties of multiplication

The commutative property for multiplication states that when you multiply two or more numbers together, you can move numbers around and still arrive at the same answer.
For any two numbers ***a*** and ***b***, $\boldsymbol{a \times b = b \times a}$.
This could also be expressed for three numbers, ***a, b and c***, as $\boldsymbol{a \times b \times c = a \times c \times b = c \times b \times a}$ and so on.
As an example, 2×3 and 3×2 are both equal to 6.

The associative property says that you can re-group numbers and you will get the same answer.
You can summarize this rule for three numbers as $\boldsymbol{a \times (b \times c) = (a \times b) \times c}$.
An example using numerical values is $3 \times (4 \times 5) = (3 \times 4) \times 5$, since $3 \times 20 = 60$ and so is $12 \times 5 = 60$.

9 Use the associative property and present the answers in the most simplified form:

$x + (3 + 5) =$ $\quad$ $9 + (4 + y) =$ $\quad$ $(7 + b) + 6 =$

$(c \times 10) \times 3$ $\quad$ $8 \times (2 \times b) =$ $\quad$ $3 \times (5 \times t) =$

10 To bring new basketballs to a sports center, two trucks have arrived with 10 boxes each. Inside each box, there are 8 basketballs. How many basketballs were in two trucks? Use the associative property of multiplication and solve the problem by two different ways:

1. ___________________________________

2. _________________________________

When you solve a problem where you have to multiply or add, remember that you can group your items in the way that works best for you!

New Material II

The distributive property explains that multiplying two numbers (factors) together will result in the same thing as breaking up one factor into two addends, multiplying both addends by the other factor, and adding together both products.

It doesn't matter how you break up one of the factors. Sometimes, for multi-digit numbers, we prioritize breaking up a factor into its expanded form, but this is not necessary. You can break up numbers to use their favorite "friendly" numbers.

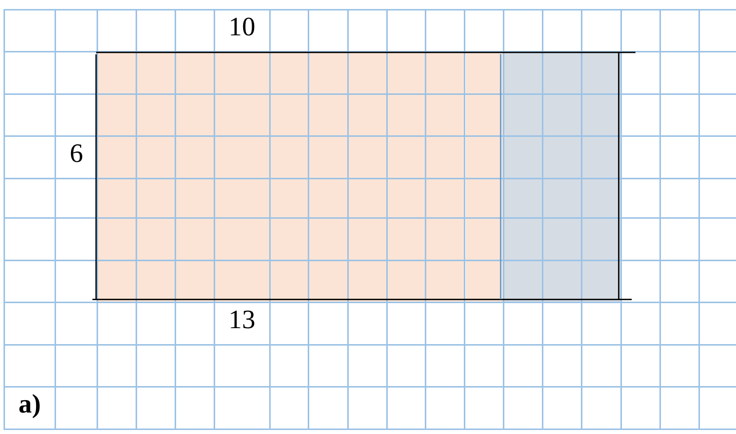
The **distributive property** $a \times (b + c) = a \times b + a \times c$, or $a \times (b - c) = a \times b - a \times c$.

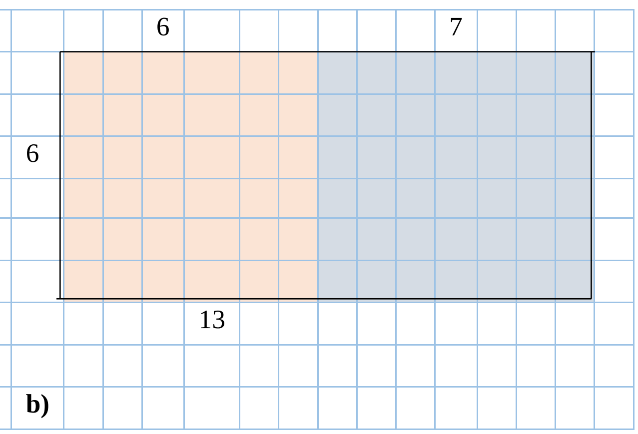
An example could be 2 × (4 + 5) = 2 × 4 + 2 × 5, since 4 + 5 = 9 and 2 × 9 = 18, and so is 8 + 10 = 18.

11

Using the drawing to understand the Distributive Property:

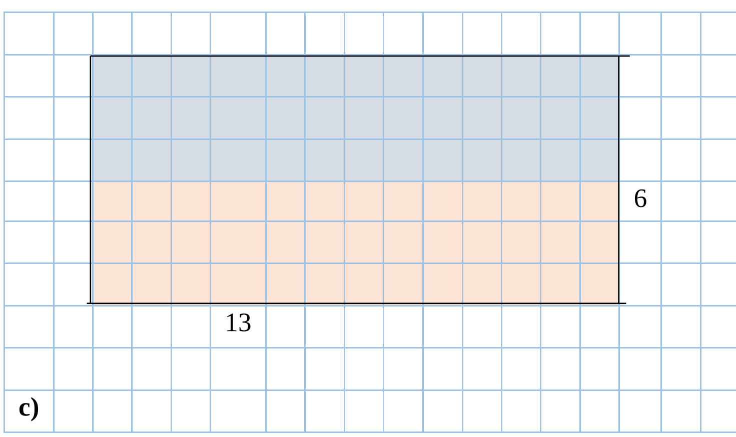
Calculate 6 × 13 using the distributive property of multiplication. Consider 4 different ways:

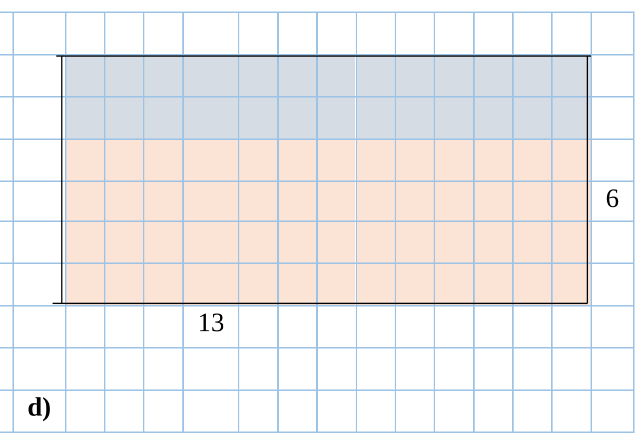




a) 6 × 13 = 6 × (10 + 3) = 6 × 10 + 6 × 3 = 78

b) 6 × 13 = 6 × (6 + 7) = 6 × 6 + 6 × 7 = 78





c) 6 × 13 =

d) 6 × 13 =

Q: Did you get the same answer? Why? ______________________________

12 Use distributive property to do multiplication

Example: $9 \times 25 = (10 - 1) \times 25 = 10 \times 25 - 1 \times 25 = 250 - 25 = 225$

$14 \times 8 =$ ____

$16 \times 5 =$ ____

$102 \times 7 =$ ____

$12 \times 25 =$ ____

$110 \times 4 =$ ____

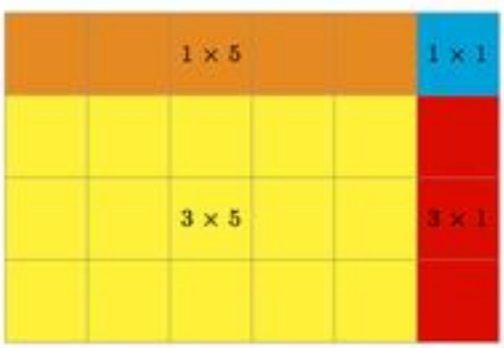
$19 \times 5 =$ ____

13 Calculate $(3+1) \times (5+1)$ using the distributive property.

Use the distributive property several times:

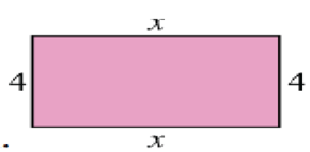
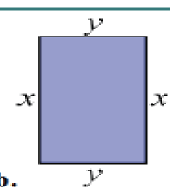
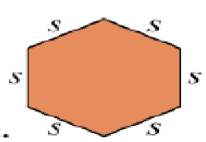
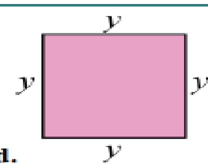
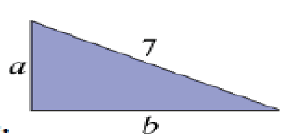
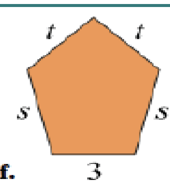
First step: $(3 + 1) \times (5 + 1) = 3 \times (5 + 1) + 1 \times (5 + 1)$

Second step: $3 \times (5 + 1) + 1 \times (5 + 1) = (3 \times 5 + 3 \times 1) + (1\times 5 + 1\times1) = (15 + 3) + (5 + 1) = 24.$



REVIEW II

14 Write the expression for the perimeter of each shape in the simplified form.

a. 	b. 
c. 	d. 
e. 	f. 

15 Write down an expression for each problem:

a) x brown ducks and y gray ducks are digging the worms. All ducks were divided into several teams with 5 ducks in each team. How many different teams can be organized?

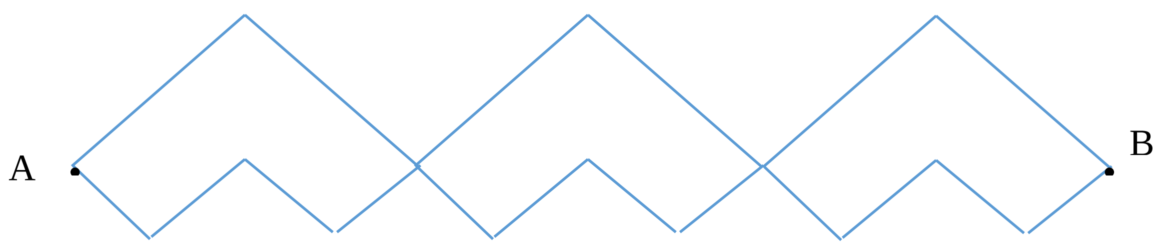
____

b) One squirrel has a acorns. A second squirrel has twice as many acorns as the first one. They decided to hide their acorns in two different places. How many acorns are going to be hide in each place? ________________________________

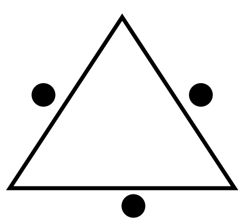
c) Caterpillar had traveled b meters, and this is c meters less than Snail. How many meters did they travel together? __________________________

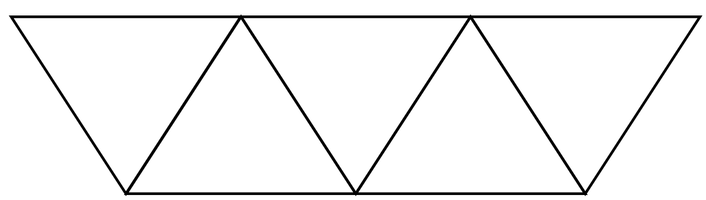
Challenge Yourself

16 How many polygonal chains connect points A and B? Compare their lengths.



17 A classroom has triangular tables. There is enough space at each side of a table to seat one child. The tables in the class are arranged in a row (as shown in the picture below).





- How many children can sit around 1 table? ____________
- Around a row of two tables? _________________________
- Around a row of three tables? _______________________
- Find an algebraic expression that describes the number of children that can sit around a row of n tables. Explain in words how did you find your expression.

____

If you could make a row of 25 tables, how many children would be able to sit around it?

____