Math 3 Classwork 18

Warm Up

1

Calculate (remember about the order of operations)

$4 \times 5 + 5 \times 6 =$ $70 - 2 \times 8 - 24 \div 6 =$

$46 + 11 \times 4 - 30 \div 5 =$ $36 \div 12 + 48 \div 12 =$

2

Compare:

25dm _____ 250cm 1m 15cm ______ 11dm 5cm 3m ____ 40dm

7dm 8cm ____ 78 cm 68dm _____ 6m 80 cm 609cm ___ 69dm

3

Calculate the most optimal way:

$17 - 24 \div 2 + 4 \times 3 =$ ____

$(6 \times 4) \div 12 - 72 \div 8 + 9 =$ ____________________________________

Homework Review

4

There are 95 stamps in two albums. After 35 stamps were removed from one of the albums, each album had an equal number of stamps. How many stamps were in each album at the beginning?

____

____

Answer: _____ stamps were in each album at the beginning.

5

The area of the rectangle is $36m^2$. How long can be the sides of such a rectangle? Fill in the possible values of ***a*** and ***b*** (sides of the rectangle) and perimeters for each rectangle with an area of $36m^2$.

	$36\ cm^2$	$36\ cm^2$	$36\ cm^2$	$36\ cm^2$	$36\ cm^2$
a					
b					
P					

New Material I

Division by zero.

Division is an inverse operation for multiplication.
A ÷ B = C means that C × B = A

B cannot be equal 0 since ***A ÷ 0*** has no meaning, as there is no number, which, multiplied by **0**, gives ***A*** (assuming A≠**0**), and so **division** by zero is **undefined**.
C × 0 = 0 and never = A!

Summary:

1. **Number divided by itself:** a ÷ a = 1where a ≠ 0 $\left(\frac{a}{a} = 1\right)$
2. **A Number Divided by 1: a ÷ 1 = *a*** $\left(\frac{a}{1} = \boldsymbol{a}\right)$
3. **0 Divided by a Number: 0 ÷ *a* = 0** $\left(\frac{0}{a} = 0\right)$
4. **A Number Divided by 0: *a* ÷ 0 is undefined** $\left(\cancel{\frac{a}{0}}\right)$

REVIEW I

6 Solve the following word problems:

a) One side of a rectangle is 5 dm. What is its other side if the area of the rectangle is 30 dm^2? ________________________________

30 dm^2

b) One side of a rectangle is ***a*** cm. Another side is 4 cm. What is the area of the rectangle? ________________________________

_____ cm^2

c) The area of a rectangle is 24 m^2. What is the width of the rectangle if its length is 8 m?

24 m^2

7 Use the rectangles to visualize the equations and to solve them:

6

30 ***x***

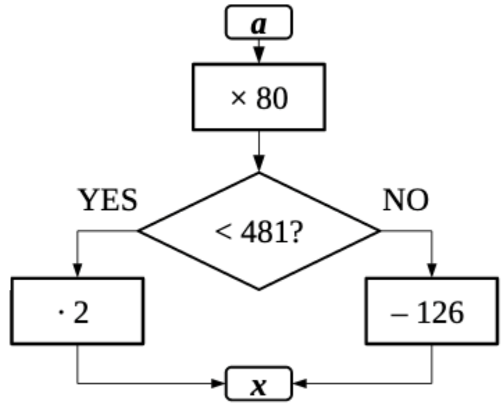
x × 6 = 30
x = _____
x = _____
x = _____

42 ÷ ***y*** = 7
y = _____
y = _____
y = _____

9 × ***z*** = 72
z = _____
z = _____
z = _____

t ÷ 6 = 8
t = _____
t = _____
t = _____

8 To solve the riddle, fill in the first table values for x; then in the second table arrange the letters in the decreasing order for x.



a	1	2	3	4	5	6	7	8	9
x									
	E	N	P	R	O	P	I	U	C

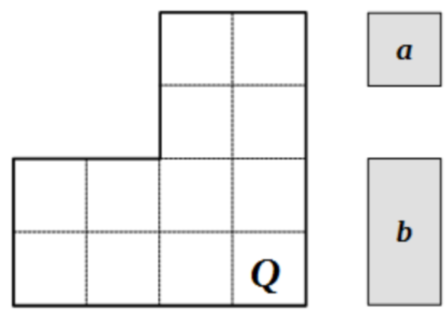
x									
Letter									

9 Use measures ***a*** and ***b*** to calculate the area of the shape ***Q***.

How many times does measure ***a*** fit in shape ***Q***? _____

How many times does measure ***b*** fit in shape ***Q***? _____

We write: ***Q*** = ___***a*** or ***Q*** = ___***b***



New Material II

Area and units of area

Area is a measure of how much surface is covered by a particular object or figure.
The square with a unit side 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.

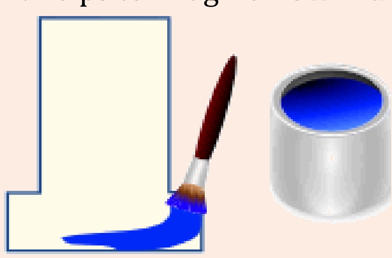
If the unit length is 1 cm, then the area of a single square will be 1 cm × 1 cm = 1 cm^2

10

Using the explanation below, express in square units:

1 dm = _____cm	1m = _____dm = _____cm
$1\text{ cm} \times 1\text{ cm} = 1\text{ cm}^2$ $1\text{ dm}^2 = 10\text{ cm} \times 10\text{ cm} = 100\text{ cm}^2$	$1\text{m}^2 = 10\text{dm} \times 10\text{dm} = 100\text{ dm}^2$ $1\text{m}^2 = 100\text{cm} \times 100\text{cm} = 10{,}000\text{ cm}^2$
5 dm^2 = _________ cm^2 3 dm^2 = _________ cm^2 300 cm^2 = _______ dm^2 2 dm^2 = _________ cm^2 800 cm^2 = _______ dm^2 7 dm^2 = _________ cm^2	2 m^2 = ______ dm^2 300 dm^2 = ______ m^2 500 dm^2 = ______ m^2 7 m^2 = ______ cm^2

Area is the size of a figure. It helps to imagine **how much paint** would cover the shape.



11

a) A gardener builds a flowerbed that is 6 meters long and three meters wide. What is the area of the flowerbed? A = ________________________________

b) Mr. Smith wants to tile the kitchen floor. How many one-meter square tiles will he need if his kitchen is 3 m long and 2 m wide? ________________________________

c) Lisa's bedroom is 6 meters long and 4 meters wide. How much carpet will Lisa need to cover the floor of her bedroom? __________________________________

d) Find the perimeter and area of a rectangle with width 6cm and length 10 cm.

P = ____________________ A = ______________________

12

Use distributive property to do multiplication

Example: $9\times25 = (10-1)\times25 = 10\times25 - 1\times25 = 250 - 25 = 225$

28 × 8 = ____

36 × 5 = ____

505 × 7 = ____

120 × 25 = ____

110 × 4 = ____

89 × 5 = ____

The distributive property explains that multiplying two numbers (factors) together will result in the same thing as breaking up one or both factor into two addends.

It doesn't matter how you break up 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** $\boldsymbol{(a + d) \times (b + c) = a \times (b + c) + d \times (b + c) = a \times b + a \times c + d \times b + d \times c}$

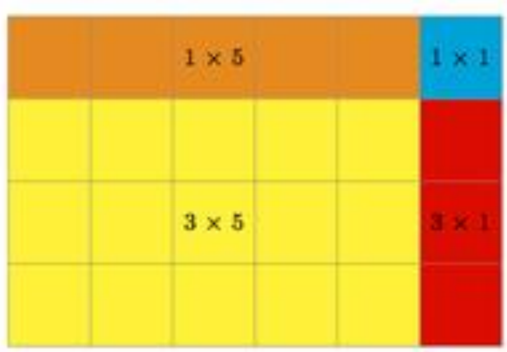
13

Calculate (3+1) × (5+1) using the distributive property.

Use the distributive property several times:

First step: (3 + 1) × (5 + 1) = 3 × (5 + 1) + 1 × (5 + 1)

Second step: 3 × (5 + 1) + 1 × (5 + 1) = (3 × 5 + 3 × 1) + (1× 5 + 1×1) = (15 + 3) + (5 +1) = 24.



14

Use distributive property to simplify:

(10 + a) × (b + 25) = ____

Did you know …

Importance of measuring area.

When building a table, putting a picture on the wall, taking some cough mixture, timing a race, and so on, we need to make measurements. Measurement answers questions such as: how big, how long, how deep, how heavy? We buy material by the meter and drive some kilometers. We state the floor space of a building in square meters, measure medicine in cubic centimeters or milliliters, and buy milk by the liter or gallons. To pave a garden, we need to know the area of the space to be paved, and when filling a pool, we need to know the volume of water required. Thus, measuring and calculating areas and volumes are two of the most basic mathematical skills required in everyday life.
Accurate measurement is essential in engineering, physics, and all branches of science. For example, astronomers need to measure time with extremely high accuracy since astronomical information is recorded from various parts of the earth. The data needs to be superimposed to obtain a complete picture. Scientific theory always requires experiment and testing, and this often involves making very careful measurements, often at very small or huge orders of magnitude.

The origin of the word **area is from 'area' in Latin**, meaning a vacant piece of level ground.

Some of the first known writings about the area came from Mesopotamia. The Mesopotamians developed the concept to deal with the size of fields and properties:
The concept of the area had many practical applications in the ancient world and past centuries:

- The architects of the pyramids at Giza, which were built about 2,500 B.C., knew how large to make each triangular side of the structures by using the formula for finding the area of a two-dimensional triangle.
- The Chinese knew how to calculate the area of many different two-dimensional shapes by about 100 B.C.
- Johannes Keppler, who lived from 1571 to 1630, measured the area of sections of the orbits of the planets as they circled the sun using formulas for calculating the area of an oval or circle.
- Sir Isaac Newton used the concept of area to develop calculus.

Among the inscribed clay tablets from Old Babylonia (ca. 1800-1600 BCE in what is now Iraq) in the Yale Babylonian Collection (YBC) are some informative mathematical finds. YBC 7290, shown above, contains a student scribe's exercise in which he (scribes were male) recorded the area of a designated trapezoid.