# Math 3 Classwork 19

## Warm Up

Practice Math Kangaroo

Independent work

**1** Which number needs to be put into the dark cloud, to have all the given calculations right?


A) 1 B) 3 C) 5 D) 7 E) 9

**2** There are 9 lampposts on one side of the path in the park. The distance between each pair of neighbouring lampposts is 8 metres. George was jumping all the way from the first lamppost to the last one. How many metres has he jumped?

A) 48 B) 56 C) 64 D) 72 E) 80

**3** Zita walks from the left to the right and puts the numbers in her basket. Which of the following numbers can be in her basket?

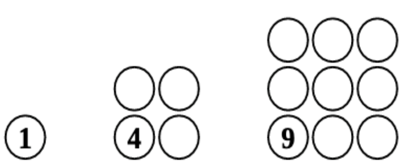

A) 1, 2 and 4 B) 2, 3 and 4 C) 2, 3 and 5 D) 1, 5 and 6 E) 1, 2 and 5

## Homework Review

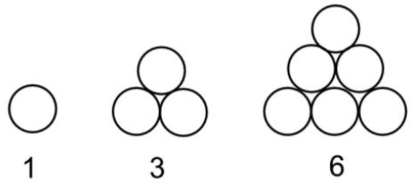
**4** Jonathan's mother wants to repaint one wall in his room. The wall is 10 feet long, the ceiling of the room is 8 feet high. There is a one window in the wall, which is 3 foot wide and 5 foot high. What is the area in square feet of the part of the wall that she wants to paint? Draw a picture of the wall with a window to help you with calculations.

A = ______________________

**5** a) Do you remember "square" numbers? Construct the next two. What is the pattern?



b) Do you remember “triangle” numbers? Construct the next four. What is the pattern?




## New Material I

**6** What is the greatest number which can be placed in the parenthesis?

*Example: 20 × (   ) < 85. Think: how many groups of 20 are there in number 85? Answer: 4*

50 × (    ) < 156    70 × (    ) < 232    80 × (   ) < 438

(    ) × 20 < 108    (   ) × 30 < 149    (    ) × 40 < 278

**7** Julia and Victoria decided to make a present for their grandparents – a photo album. They had 46 photographs to put in the album. A full-page holds six photographs. What is the smallest number of pages girls should use to put all the photos? How many photos will the last page hold?

____________________________________________

____________________________________________

**Division with remainders. All numbers are whole numbers!**

**Division** is different from addition, subtraction, and multiplication. When you divide two numbers you can end up with a **remainder.** A remainder is simply a portion of the dividend which is left over after one number is divided by another number.

$m \div n = q + r, m > n, r < q$

In general, if $m$ is **dividend**, $n$ is **divisor**, $q$ is **quotient** and $r$ is **remainder** then

$m = n \times q + r$. Divisor $n$ should always be greater than remainder $r$. $r < n$

*Examples: 10 ÷ 3 = 3r1    9 ÷ 3= 3r0    8 ÷ 3 = 2r2    7 ÷ 3= 3r1*

**8** Calculate and write down the answer with a remainder where needed:

28 ÷ 3 = __________    28 ÷ 4 = ___________    28 ÷ 5 = __________    28 ÷ 6 = ___________

Find quotient and remainder from the division of different numbers by 3.

**9** 10 ÷ 3 = ___ + ____    14 ÷ 3 = ___ + _____    29 ÷ 3 = ___ + ___

16 ÷ 3 = ___ + ___    47 ÷ 3 = ___ + ____    31 ÷ 3 = ___ + ___

**10** Is it possible to get a remainder 5 or 6 or 7 while dividing a number by 4? _______

**11** What are the remainders that can be obtained while dividing a number by 6? Assume that a dividend is greater than 6. Give examples for each remainder.

_________________ ___________________ ______________________

_________________ ___________________ _____________________

# REVIEW I

When evaluating expressions, you don't always have to follow the order of operations strictly. Sometimes you can play around with the expression first. You can commute (with addition or multiplication), associate (with addition or multiplication), or distribute (multiplication or division over addition or subtraction).

Know your options!

**12.** Consider the expression:

$$(32 \times 4) \times (25 \times 10) \times (10 \times 2)$$

Using an associative property of the multiplication, it could be rewritten as the following expression:

$$32 \times (4 \times 25) \times (10 \times 10) \times 2$$

**Q:** Why is the $2^{nd}$ grouping is more convenient than the $1^{st}$?

**13.** Compare, using <, >, or =. Use all properties of addition and multiplication.

a) $(8 + 5) - 7 \dots (8 + 7) - 5$

b) $2 \times (3 + 4) \dots (2 \times 3) + 4$

c) $(10 \times 5) \div 2 \dots 10 \times (5 \div 2)$

***Special**: Fast mental calculation using a distributive property.*

# New Material II

Any collection of things or objects we call a **"Set."**
Here are some examples:
- Set of all digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9
- Set of all days of the week.
- Set of all months.

**A common property** amongst the objects may define a set.
For example, the set E of positive even numbers is the set E={2, 4, 6, 8, 10…}.

There is a fairly simple notation for sets. We list each element (or "member") of the set separated by a comma and then put curly brackets around the whole thing: {1, 2, 3, …}.

1, 2, and 3 are "elements" or "members" of the set. Three dots means that it goes on forever. This set is **infinite**. Not all sets are infinite.

For example, consider the set of all letters of the English alphabet: {a, b, c, ..., x, y, z}
In this case, it is a **finite** set (there are only 26 letters, right?)

When talking about sets, it is fairly standard to use Capital Letters to represent the name of the set, and lowercase letters to represent the elements in that set.
For example, **A** is a name of a set and ***a*** is an element in A. A= {a}.

**14** Name the set that the following elements belong to.
Then name another element that belongs to the set.
*Example: A rose, a tulip, a sunflower. This is a set of flowers and A rose, a tulip, a sunflower are the elements of this set. Another element of the set would be: a lily.*

a) A mother, a baby, a father, a grandfather. Is a set of: ________________.
Another element of the set is: ________________.

b) Math, Science, English. Is a set of: ________________.
Another element of the set is: __________________.

c) A penny, a quarter, a nickel. Is a set of: ________________.
Another element of the set is: ________________.

d) A cucumber, a pepper, an onion. Is a set of: ________________.
Another element of the set is: __________________.

e) Come up with your own example of a set and its elements. A set of: ________________.
The elements of the set are: ________________________________________________

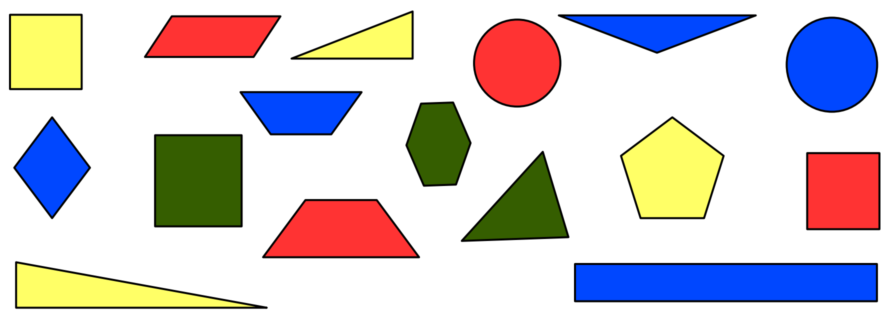
Sometimes we have sets which are different but still have some common elements.
*For example - all flowers and white flowers or all fish and freshwater fish.*

We illustrate relationship between various sets by using **Venn diagrams**: we draw all objects as points on the plane, and then we draw a loop (or some other shape) around all objects of a particular set.
Different loops correspond to different sets.

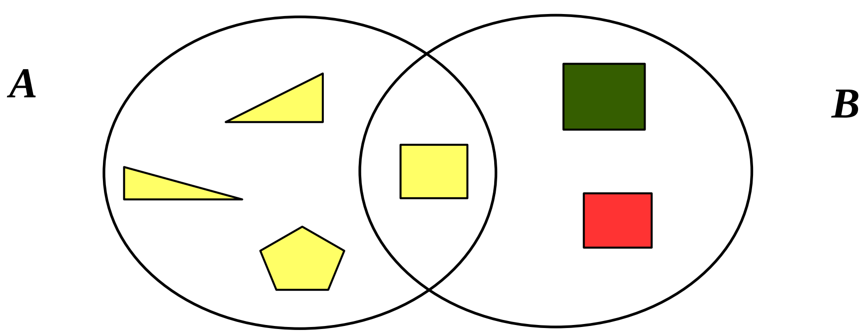
**15** Let us sort those shapes out into different groups (sets).

a) Name different properties that can be used to sort the following shapes:

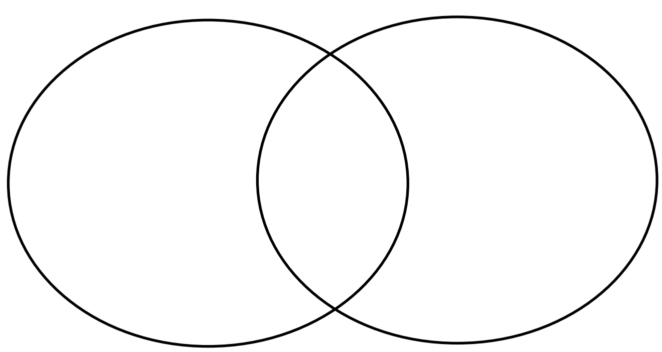
- ____________________
- ____________________
- ____________________



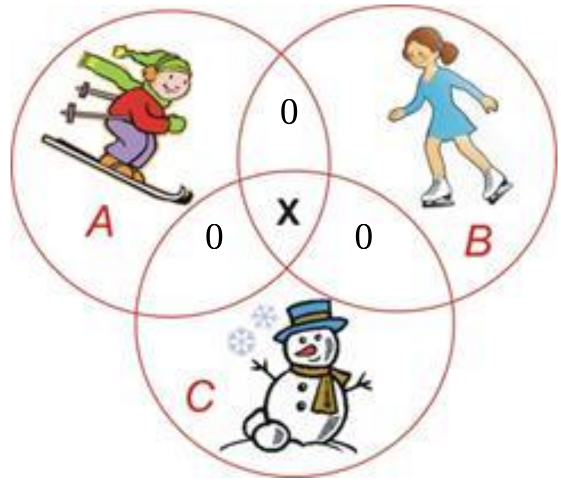
Look at the drawing below. All yellow shapes are in the set ***A;*** all squares are in the set ***B.***
Yellow squares form a set that belongs to both sets – ***A*** and ***B***.




b) In circle ***A*** place all red shapes (draw those shapes using red pencil)
In circle ***B*** place all circles. What shapes will be in the overlap of two sets ***A*** and ***B***?



**16** There are 24 students in the class. They all have had a wonderful winter break and participated in various activities. 10 of them went skiing, 16 went skating and 12 were making a snowman. None of the students were involved in 2 activities. How many students could do all 3 activities?




___________________________________

___________________________________

## Did you know …

**John Venn** (4 August 1834 – 4 April 1923) was a British logician and philosopher.
John Venn came up with Venn Diagrams in 1880 while working at the famous University of Cambridge. Venn's main area of interest was logic, and it was in this field, he made his most important contribution. This was the introduction of Venn diagrams (that is, overlapping circles used to represent properties of sets and subsets) in his book "Symbolic Logic" in 1881. Venn was not the first person to use these diagrams. They had been used by others before him, such as Gottfried Leibniz in the 17th century. Venn did, however, make important contributions and additions to it, and his efforts led them to be standardized and widely used in academia and research.
Venn also had a rare skill in building machines. He used his skill to build a machine for bowling cricket balls, which was so good that when the Australian Cricket team visited Cambridge in 1909, Venn's machine clean bowled one of its top stars four times.
With his son, he wrote a two-volume history of Cambridge and compiled an extensive database of biographical information on some 136,000 Cambridge graduates and staff, from "the earliest times" to the dawn of the 20th century.