MATHS WORKBOOK

ZÁKLADNÍ ŠKOLA, TŘEMOŠNICE, OKRES CHRUDIM
ZŠ SAMA CAMBELA, SLOVENSKÁ ĽUPČA
KOLIN KOULU, LIEKSAN KAUPUNKI, NORTH CARELIA

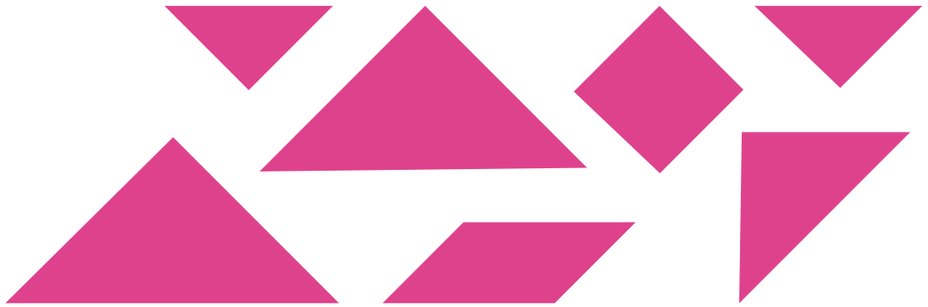
FIT SCHOOL CHILDREN

Co-funded by the
Erasmus+ Programme
of the European Union

Základní škola, Třemošnice, okres Chrudim
ZŠ Sama Cambela, Slovenská Ľupča
Kolin koulu, Lieksan kaupunki, North Carelia

MATHS WORKBOOK

1. Problem

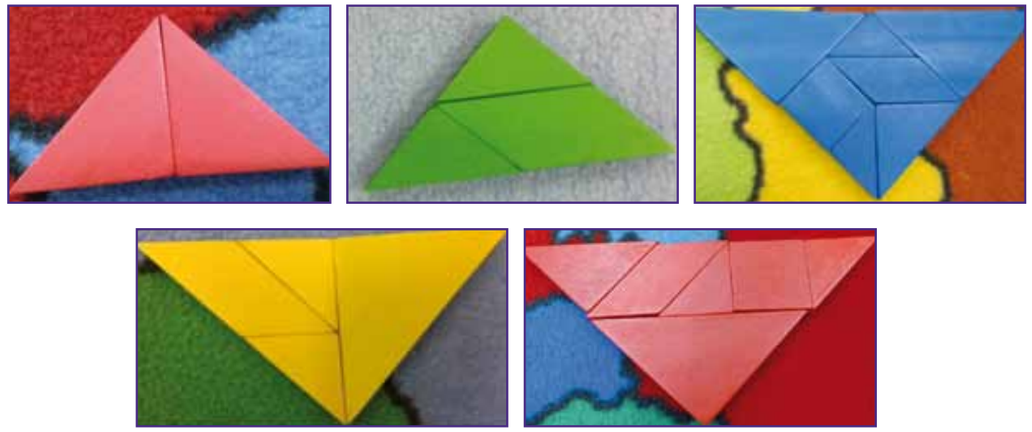


A Make triangles from tang ram pieces. Try to make 1 piece, two pieces, three pieces, four peaces, five pieces, six pieces and seven piece triangles. Which one is impossible to do?

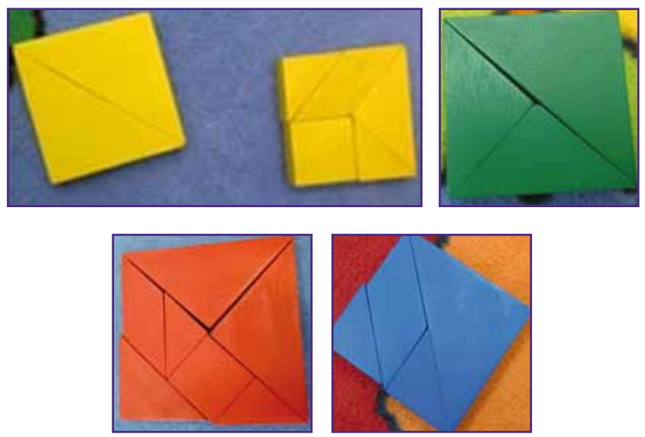
B Make squares from tang ram pieces. Try to make 1 piece, two pieces, three pieces, four pieces, five pieces, six pieces and seven pieces square. Which one is impossible to do?

Solution

A Possible triangles are 1, 2,3,4,6 and 7. So 5 piece triangle is not possible with tang rams. Make triangles from tang ram pieces. Try to make 1 piece, two pieces, three pieces, four peaces, five pieces, six pieces and seven piece triangles. Which one is impossible to do?



B Possible squares are 1, 2,3,4,5 and 7. So 6 pieces square is not possible with tang rams.



2. Problem

Hilbert's paradox of the Grand Hotel:

Long ago, in a land far away, there was a grand hotel where there were infinitely many rooms. This hotel was attended by a brilliant manager.
One night, a guest arrived, but the hotel was full — each room was occupied by one guest. The newly arrived guest asked if a spare room was available. "Of course we have, we are the Infinite Grand Hotel. There is always a room for everyone," the manager said proudly.

How is possible to accommodate new guest?

Solution

Now since each room was occupied by a guest, the manager requested the guest in Room 1 to move to Room 2, the guest in Room 2 to move to Room 3, the guest in Room 3 to move to Room 4, and so on. Basically, he told every guest in Room n to move to Room n + 1. Since the hotel had infinitely many rooms, there was no problem in moving, there was always a room to move to. This left Room 1 vacant, and therefore, the guest was accommodated. The guest was happy. The manager was happy.

GUEST IN ROOM	goes to	ROOM	PASSENGER NUMBER	goes to	ROOM
1	→	2	1	→	1
2	→	4	2	→	3
3	→	6	3	→	5
4	→	8	4	→	7
5	→	10	5	→	9
...	→	...	...	→	...
n	→	2n	n	→	2n−1

3. Problem

Girls ran 60 m track.
Dana finished first in 12,4 s,
Jana in 9,7 s,
Mária in 11,3 s
Zuzana in 9,9 s.

Which of the girls ran fastest and how was her speed higher comparing with the slo

Solution

Dana < Zuzana < Mária < Jana
9,7 < 9,9 < 11,3 < 12,4

$$v1 = \frac{60}{9,7} = 6,186\ \frac{m}{s}$$

$$v2 = \frac{60}{12,4} = 4,839\ \frac{m}{s}$$

$$6,186 - 4,839 = 1,347\ \frac{m}{s}$$

Dana ran fastest and she was 4,8 $\frac{km}{h}$ compared to the slowest girl called Jana.

4. Problem

There are 4112 books for young readers in the library. It is 16 per cent of the total number of books in the library.
What percentage of the library books make the encyclopaedias if there are 2056 of them?

Solution

16 % are 4112 books → 1 % is 4112 : 16 = 257 books

100 % is 257 . 100 = 25 700 books

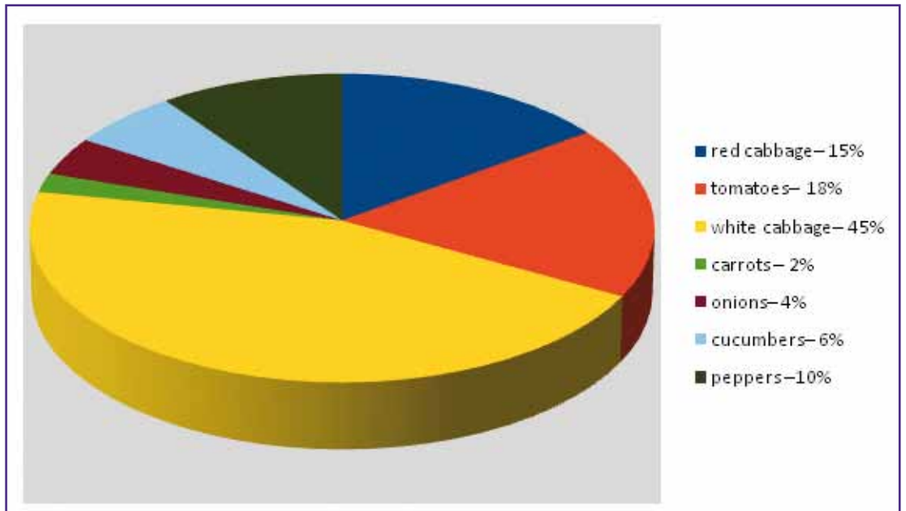
2056 books make 2056 : 257 = 8 %

Encyclopaedias make 8 % of the library books.

5. Problem

The chef in the hotel restaurant has prepared 1500 grams of potato salad. The salad ingredients are represented in this graph:

Find out, how many grams of carrots and how many grams of white cabbage he needed.



Solution

Find out, how many grams of carrots and how many grams of white cabbage he needed.

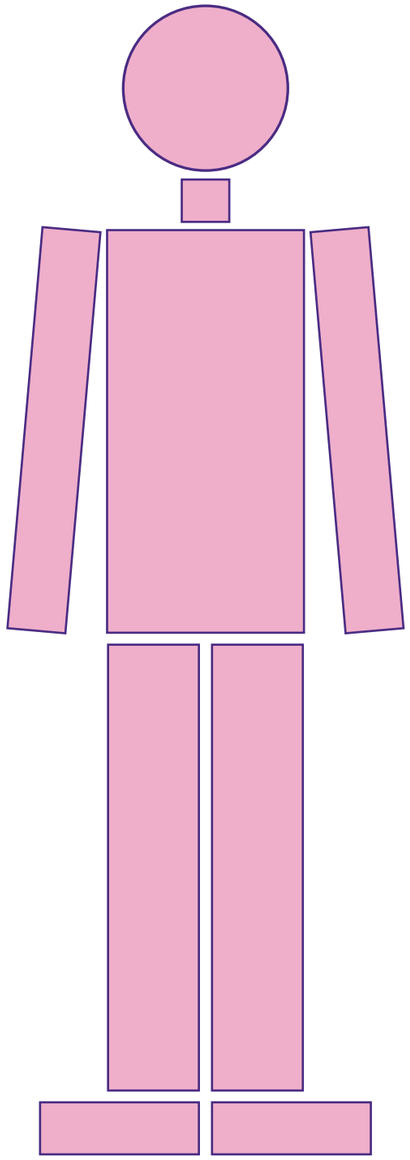
White cabbage:
calculation: 0,45 . 1500 = 675g

carrots:
calculation: 0,02 . 1500 = 30 g

The chef needed 675 grams of white cabbage and 30 grams of carrots.

6. Problem

Working with the tape and the scales



Circumference of the head:

-

Stature:

-

Length of the hand:

-

Lenght of the leg:

-

Weight:

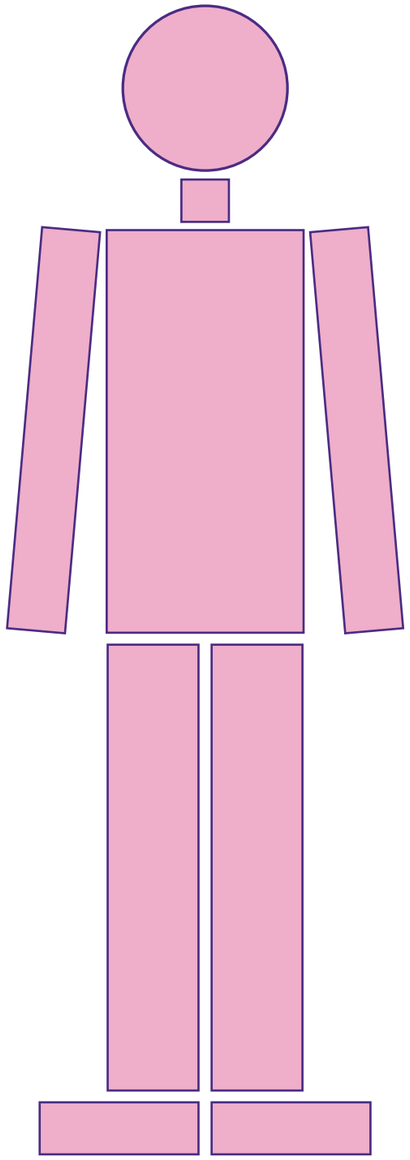
-

Size of the foot:

-

Example of solution

Name of the pupil: **Martin Urban**



Circumference of the head:

- 51,5 cm

Stature:

- 150 cm

Length of the hand:

- 63 cm

Lenght of the leg:

- 80 cm

Weight:

- 36 kg

Size of the foot:

- 22 cm

7. Problem

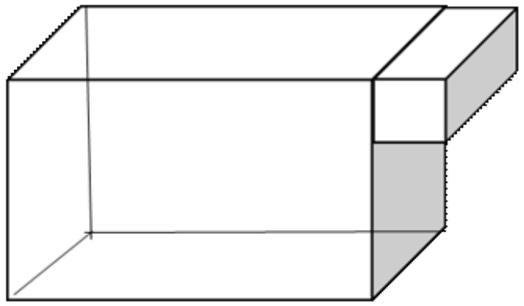
Working with the tape

A **Measure – Content**

Measure red marked playing area in the gymnasium and calculate its content.

B **Measure - volume**

1) the length of the gymnasium
2) the width of the gymnasium
3) the height of the gymnasium is 2/3 of its width



C Calculate the volume of air in the whole gymnasium, add 6% for balcony to result.

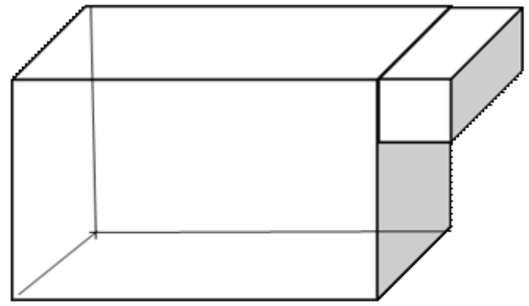
Example of solution

gymnasium of Primary school Třemošnice

A

a = 24 m
b = 11 m
S = a . b
S = 24 . 11
S = **264 m²**

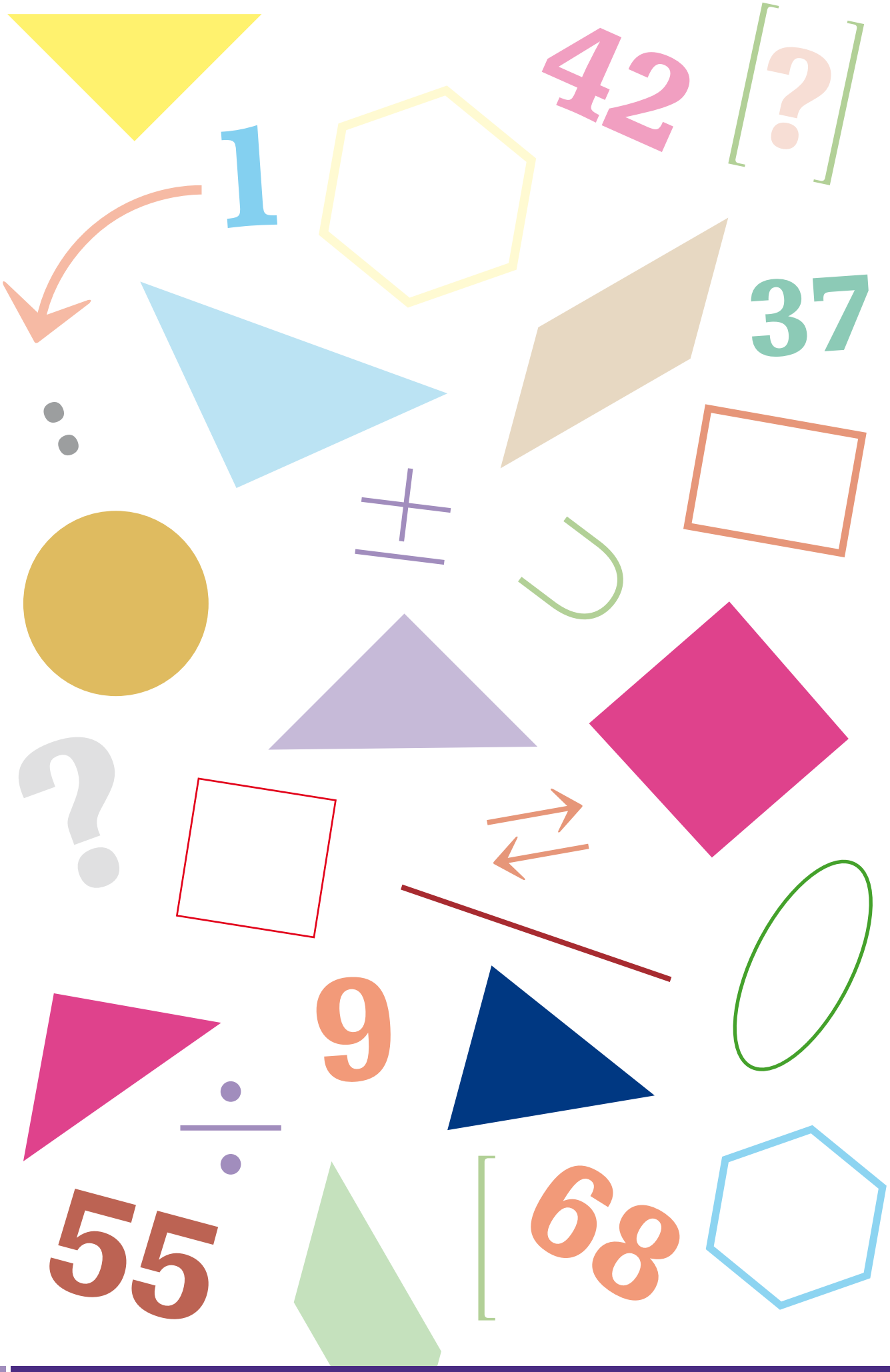
B



a = 31 m
b = 18 m
c = 2/3 . 18
c = 12 m
V_1 = a . b . c
V_1 = 31 . 18 . 12

C

V_2 = 6 % z 6696 = 6696/100 . 6 = **401,76 m³**
V = V_1 + V_2 = 6696 + 401,76 = **7097,76 m³**


42
[?]
1
37
9
55
[
68