

Meeting 3

Math Kangaroo Problem Solving

October 18, 2015

1. The first day of a month is a Sunday. There are 5 Sundays in this month. The last day is a Tuesday. How many days are there in that month?

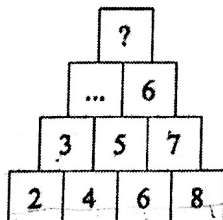
S M T W R F Sa
 S M T W R F Sa
 S M T W R F Sa
 S M T W R F Sa
 S M T

There are 4 complete weeks with 3 extra days.
 This equals $4 \times 7 = 28$
 $\uparrow \quad \uparrow$
 #weeks #days per week
 added to 3 extra days.
 $28 + 3 = \boxed{31 \text{ days}}$

What month could this be?

Jan, Mar, May, July, Aug,
 Oct, Dec

2. Which number should be at the question mark in the pyramid?



5

Note that the diagonals from left to right are ascending consecutive #s, while diagonals from bottom to top, right to left are descending consecutive #s.

3. There are sheep and ^{cows}chicken on a farm. The number of ^{cows}chickens is equal to the number of sheep. All together, they have 24 legs. How many ^{cows}chickens and how many sheep are there on the farm?

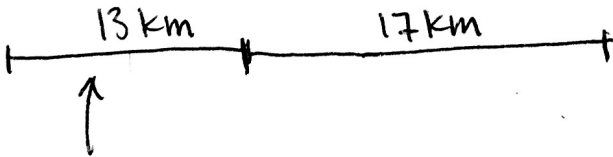
Sheep = 4 legs Cows = 4 legs

If 24 total legs, then must have 6 ~~not~~ total animals ($24 \div 4 \text{ legs} = 6 \text{ animals}$). Since # cows = # sheep, half of these 6 animals are cows, and the other half are sheep.

3 cows
3 sheep

4. Last week, John walked a total of 26 kilometers. Sarah walked half of this distance plus another 17 kilometers. Who walked more? By how much? Draw a picture.

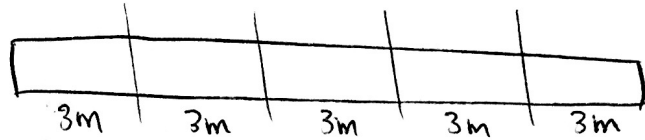
John  = 26 km

Sarah  = 30 km

$\frac{1}{2}$ of distance John walked.

Sarah walked more, by $30 \text{ km} - 26 \text{ km} = 4 \text{ km}$

5. A log that is 15 meters long needs to be cut into pieces that are 3 meters long. How many cuts do we need to make?



4 times

3 meters goes into 15 meters 5 times. ($15 \div 3 = 5$).
You need to cut the log only 4 times to achieve this.

6. Dad and son came home after a day of working on the farm. Mom offered to make them cookies for all their hard work. She made a total of 20 cookies. The father ate 6 more cookies than the son. The father and son ate all of the cookies. How many cookies did the son actually eat?

Father ○ ○ ○ ○ ○ ○

Son
↑

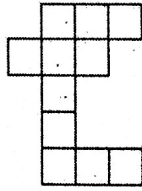
Let the bar represent
the amount the son ate.

Then $20 - 6 = 14$ must be twice the # the son ate.

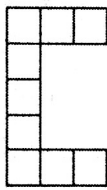
The son ate 7, and the father ate 13.

Alternatively, guess and check by plugging in
#s and verifying.

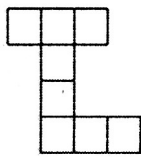
7. Which of the figures below cannot be cut out from this figure:



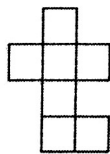
(a)



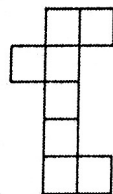
(b)



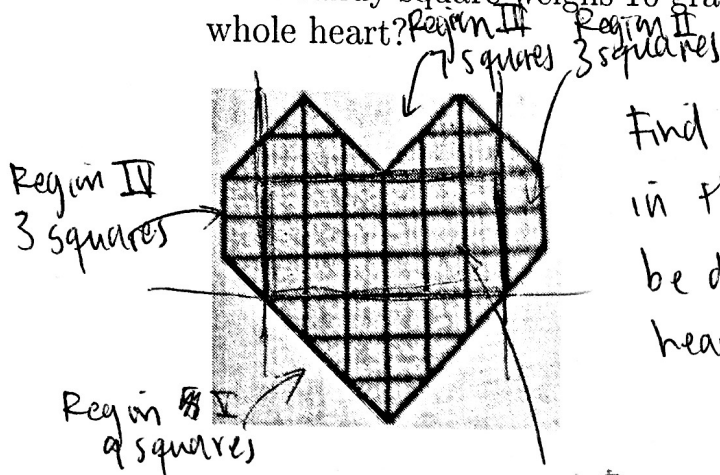
(c)



(d)



8. Kuba bought a chocolate heart for his mother (see the picture). Each candy square weighs 10 grams. What is the weight of the whole heart?



Find the # of candy squares in the chocolate heart. This can be done by splitting the heart into sections.

→ 40 total squares

(a) 340 g

(b) 360 g

(c) 380 g

(d) 400 g

(e) 420 g

Region I
18 squares

~~Weight~~

Weight of whole heart

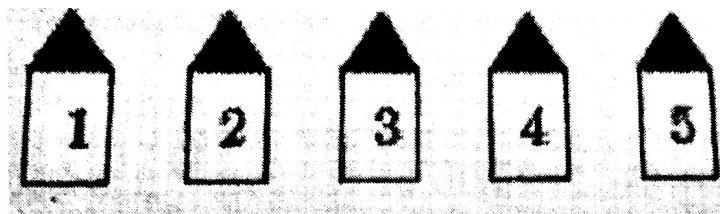
$$= (\# \text{ squares}) \times \left(\begin{array}{c} \text{weight} \\ \text{per square} \end{array} \right)$$

$$= (40) \times (10 \text{ g}) = \boxed{400 \text{ g}}$$

9. The buildings on Color Street are numbered from 1 to 5 (see the picture below). Each building is colored with one of the following colors: blue, red, yellow, pink or green. It is known that

- The red building is only next to the blue building.
- The blue building is between the red building and the green building.

What is the color of the building number 3?



Scenario 1 →

R

B

G

Scenario 2 →

G

B

R

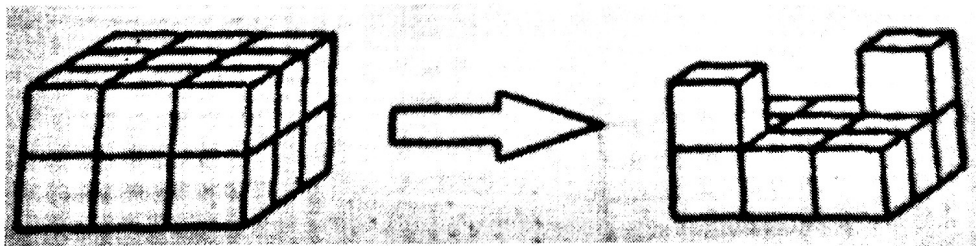
Red must be at the end, since it is only next to blue.

→ ~~whether~~ whether red is at house #1, or house #5, house #3 is always green based on the instructions.

Green

10. How many cubes have been removed from the first structure to make the second one?

7 cubes



How many cubes are there left in the second structure?

11 cubes

11. Helen has \$5. She is going to buy 5 notebooks that cost 80 cents each and a certain number of pencils that cost 30 cents each. What is the biggest number of pencils that she can buy?

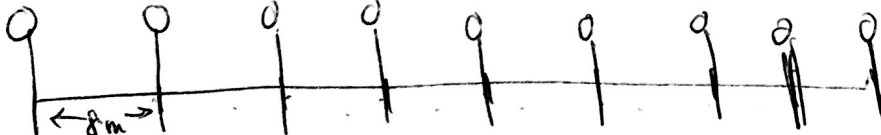
$$(5 \text{ notebooks}) \times (80¢ \text{ each}) = \$4 \text{ spent on notebooks}$$

$$\$5 - \$4 \text{ on notebooks} = \$1 \text{ for pencils.}$$

At 30¢ each, ~~and~~ and \$1 left, Helen can only buy 3 pencils ($3 \times 30¢ = 90¢$)

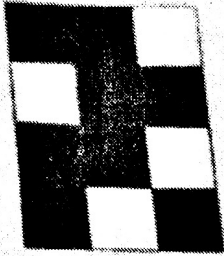
3 pencils

12. There are 9 lanterns on one side of an alley in the park. The distance between neighboring lanterns is 8 meters. Gregory went through this alley from the first lantern to the last lantern. How many meters did he walk?

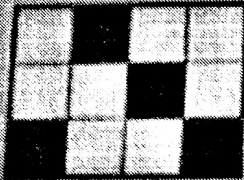


$$(8 \text{ m}) \times (8 \text{ spaces between the lanterns}) = \boxed{64 \text{ m}}$$

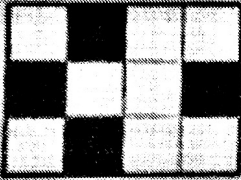
13. Five identical rectangular plastic sheets were divided into white and black squares. Which of the sheets from A to E has to be covered with the sheet right below this question in order to get a completely black rectangle?



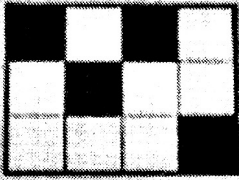
A:



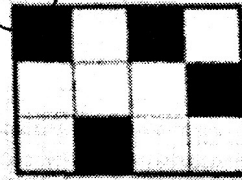
B:



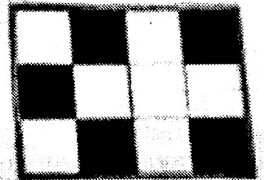
C:



D:

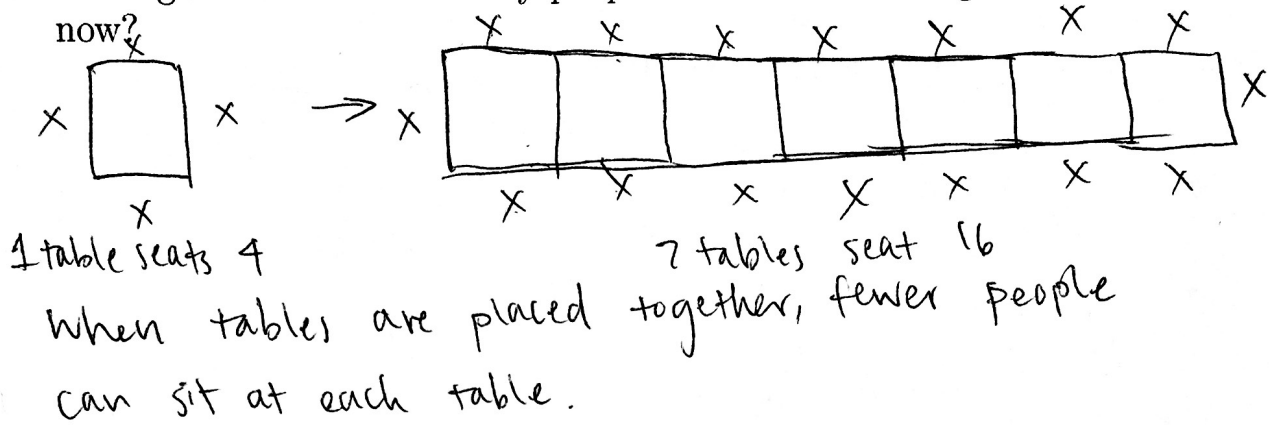


E:



Must rotate
the sheets
to stack on
top of each other.

14. Four people can sit at a square table. For the school party the students put together 7 square tables in order to make one long rectangular table. How many people can sit at this long table now?



16 people

15. There are four siblings in the room: Anna, Brian, Corey, and Dalia.

- Anna is twice as old as Brian.
- Brian is 3 years older than Dalia.
- Corey is half Dalia's age.
- Corey is 5 years old.

How old is Anna?

Corey = 5 yrs old.

Corey is half of Dalia's age, so Dalia must be 10.

Brian is 3 yrs older than Dalia, so he is 13.

Anna is twice as old as Brian, so she is $(13 \times 2) = 26$ yrs old

26 years old