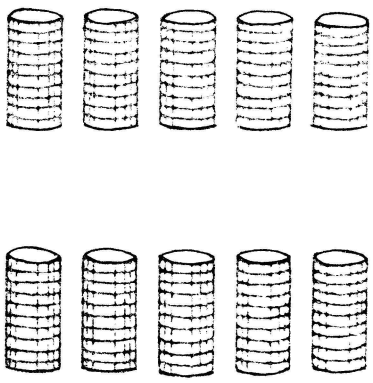
PROBLEM SHEET 1

Six students, A, B, C, D, E and F took a college entrance examination.

1. A and B received the same marks.
2. A was higher than C.
3. C was higher than D.
4. E was lower than A but higher than D.
5. E was lower than C.
6. B was lower than F.

Your task is to rank the six students in order from high to low.



As the illustration shows, there are ten piles of money, each consisting of ten silver coins. All the coins in one pile are counterfeit, but we do not know which pile that is. We know the correct weight of a legal coin, and we know that the counterfeit coin weighs one gram more than a genuine one.

Using a spring scale, identify the pile of counterfeit coins by only one weighing.

Where do you often see the fraction $^{24}/_{31}$?

Write the 2 letters which should appear next in the series.

CBFEIHLK

Which set of letters is different the other 3 sets?

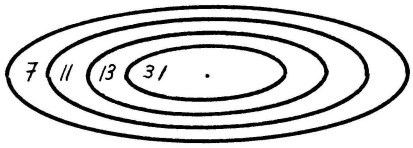
a. HRTG b. NOMP

c. XACW d. LDFK

These are some rabbits and some rabbits hutches. If seven rabbits are put in each rabbit hutch, one rabbit is left over. If nine rabbits are put in each rabbit hutch, one hutch is left empty.

Can you find how many rabbit hutches there are?

Can you find how many rabbits there are?



What is the minimum number of hits necessary to score exactly 100 on this rather unusual rifle target?

20 is to 30 as 10 is to ___?

a. 5 b. 25 c. 60 d. 15 e. 10

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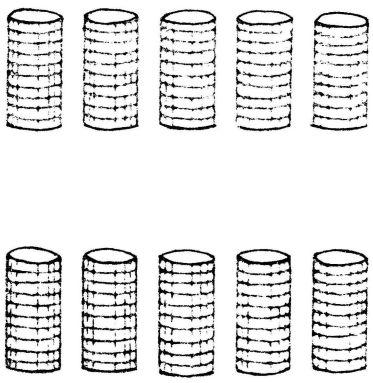

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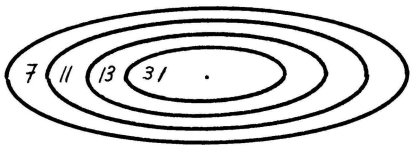

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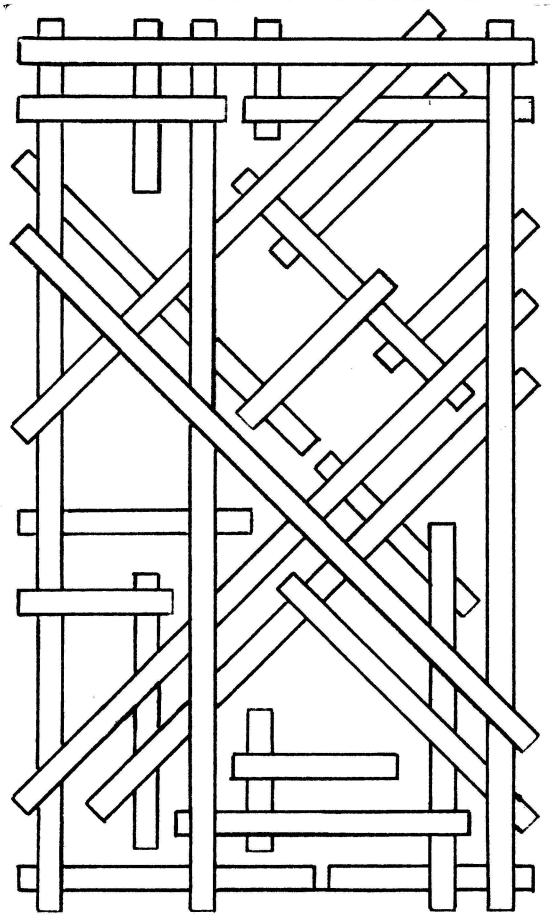
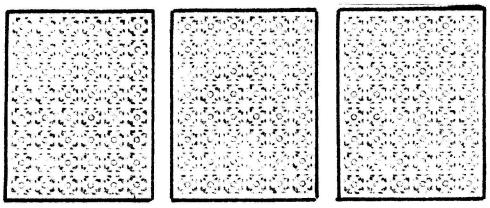
The illustration opposite shows a view looking directly down upon a pile of straight 5mm x 5mm square rods of various lengths. Identify the highest point of the whole pile.



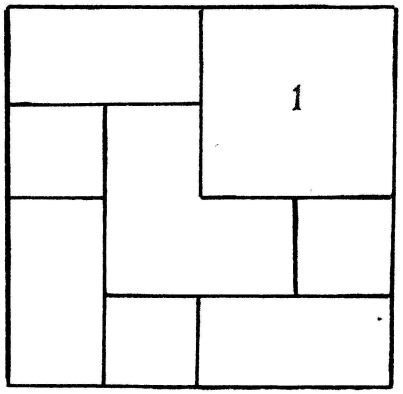


Three cards lie face down in a row

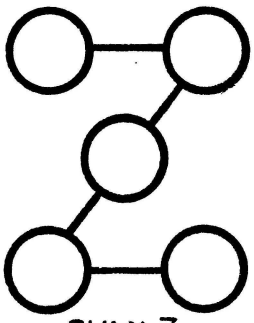
1. There is a queen on the right of a king.
2. There is a queen on the left of a queen.
3. There is a spade on the left of a heart.
4. There is a spade on the right of a spade.

Identify the three cards.

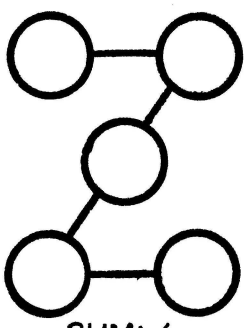
Eight square sheets of paper, all the same size, have been placed on a table. They overlap as shown in the illustration. One sheet (1) is shown completely, and the seven others are only partly exposed. Number the squares in order from the top layer to the bottom.



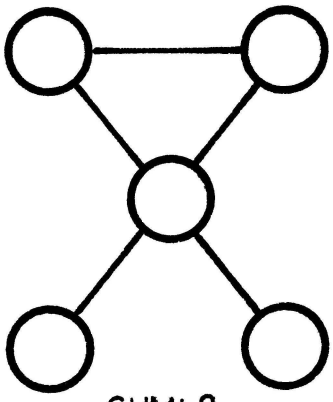
Use the numbers 1 to 5 to solve these sum puzzles. Each straight line must sum to the number given at the bottom.



SUM: 7

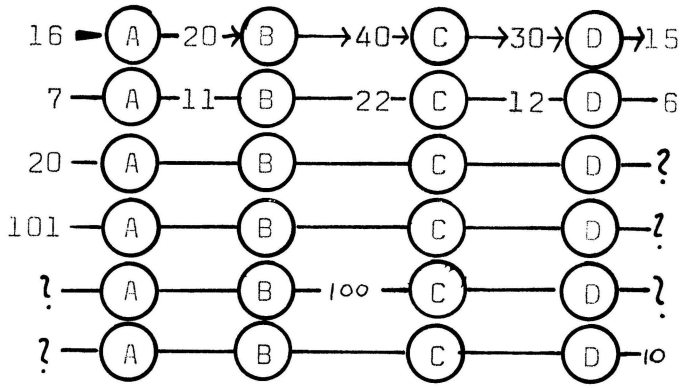


SUM: 6



SUM: 9

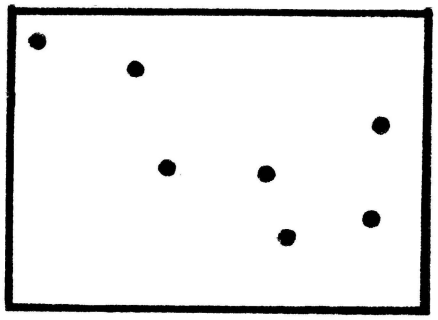
PROBLEM SHEET 2



Three playing cards are face down on the table. With the help of the following clues, find the value of each card:

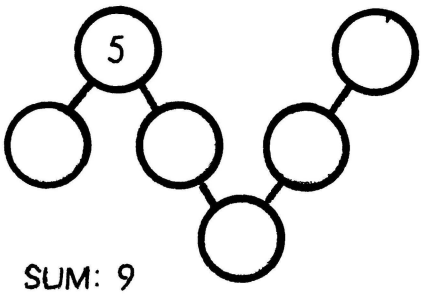
1. The total value of A and B is 15.
2. The total value of B and C is 17.
3. No card is a 7 or has a value higher than 9.

Here you see the seven stars of the Big Dipper. Draw three straight lines that will put each star in a separate region of the rectangle.



Some people had afternoon tea in a cafe. The cafe only sold tea and cakes. Tea cost 3p a cup. Cakes cost 5p each. Everyone had the same number of cups of tea. The bill came to £1.33. Can you find out how many cups of tea each one had?

Use the numbers 1 to 6 to solve these sum puzzles. Each straight line must sum to the number given at the bottom.



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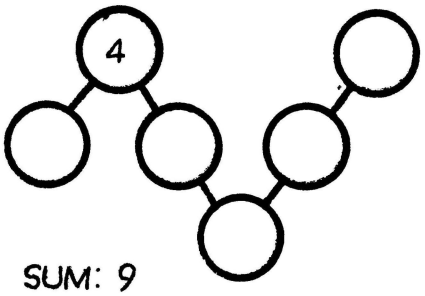

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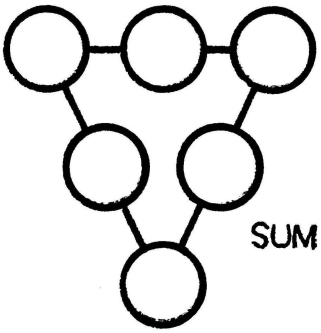
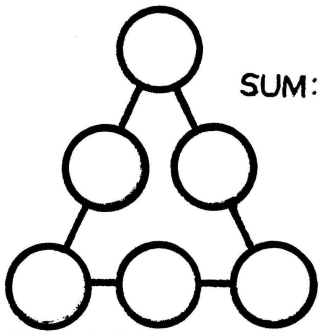


SUM: 10



SUM: 11

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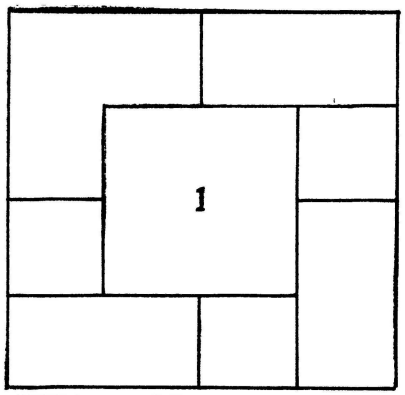
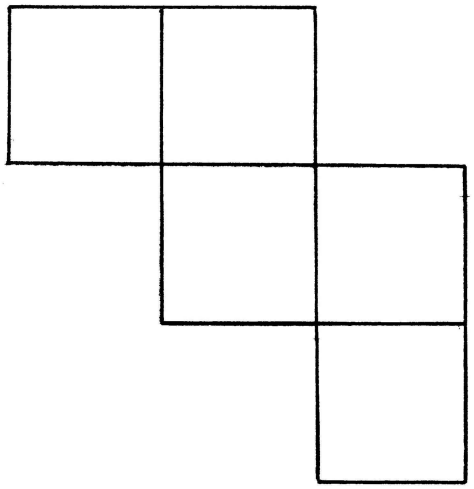


Make a large copy of this shape. Cut it out and fold it up, it will make a box.

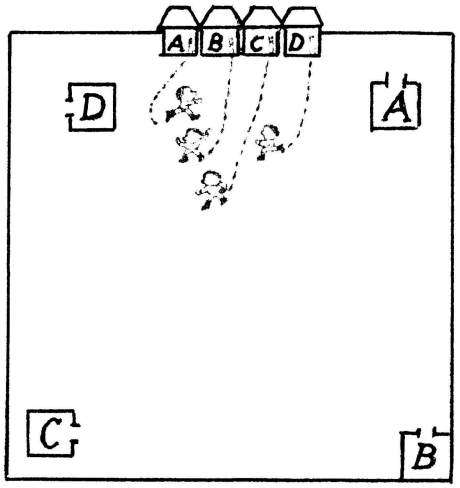
Where could you add another squre onto the shape so that when you cut it out an and fold it up you will get a box with a lid?

Find as many shapes as you can which will fold into a box with a lid.

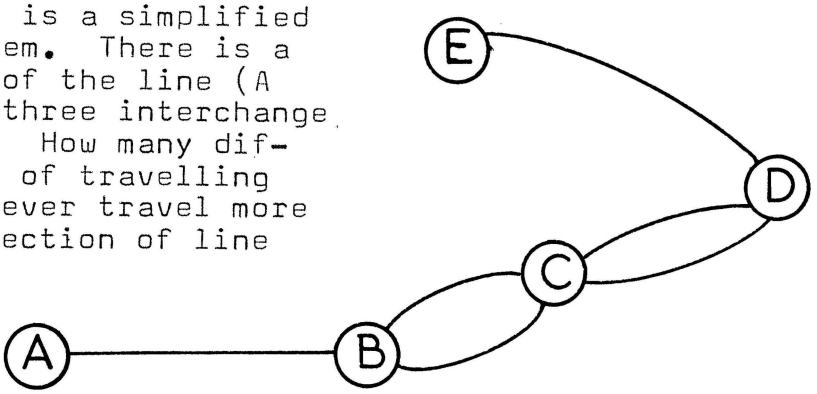


Each of four children lives in one of the houses A,B,C and D. Each goes to a different school. One morning after a snowstorm there were footprints of the four students in the snow. The footprints showed that no child crossed the path of another child on the way to school.

Can you draw four paths showing how each child walked from his house to school that bears the same letter as his house? No path may cross another or go outside the picture's border.

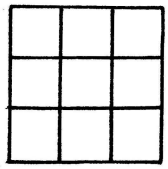


The diagram following is a simplified map of a railway system. There is a terminus at each end of the line (A and E) and there are three interchange stations (B,C and D). How many different ways are there of travelling from A to E, if you never travel more than once along any section of line during any journey?

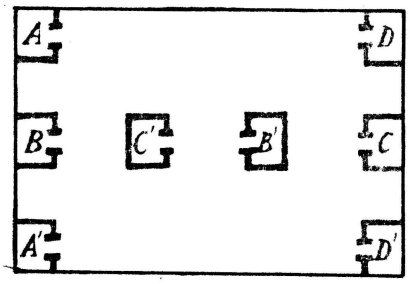


PROBLEM SHEET 3

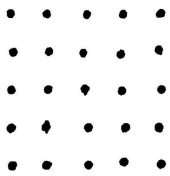
Arrange the numbers 1 to 9 so that the total is 15 when added horizontally, vertically, and diagonally.



The illustration shows eight houses and their front doors. The problem is to draw a line from the door of A to the door of A', another line that joins the doors of B and B', a third line that joins C to C', and a fourth that joins D to D'. No line may cross another line, pass through the sides of a house, or cross the outside rectangular border of the picture. The problem may seem impossible to solve, but it can be done.



The illustration shows a regular 5 x 5 array of dots. How many different but perfect squares can be drawn on the illustration, in such a way that each corner of each square lies on a dot?



Write the 2 numbers which should appear next in the series.

3 9 5 15 11 33 29

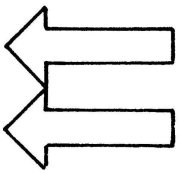
Which number is repeated first in the following series?

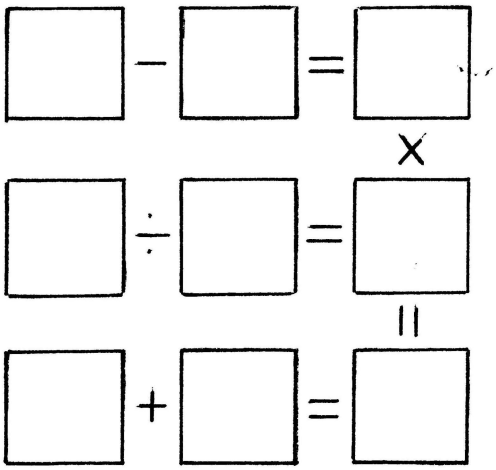
5 9 4 8 2 3 6 1 7 4 7 8 9 1 5 2 3 5
8 9 5 3 5 4 3 7 1

a.7 b.8 c.6 d.4 e.5

If you are facing east and turn left, then make an about-face and turn left again, in which direction are you facing?

Using only two straight lines, make a third arrow:

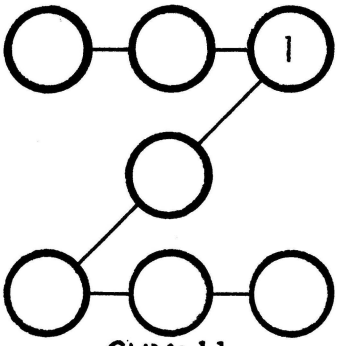




Write a different digit in each of the nine squares so that the three horizontal expressions and the single vertical one are all correct. You must use each digit from 1 through 9, and you may not use the same digit twice.

A man has to deliver a message across a desert. Crossing the desert takes 9 days. One man can only carry enough food to last him 12 days. No food is available where the message must be delivered. Two men set out. Can the message be delivered and both men return to where they started without going short of food? Food may be buried on the way out and used on the way back.

Use the numbers 1 to 6 to solve these sum puzzles.



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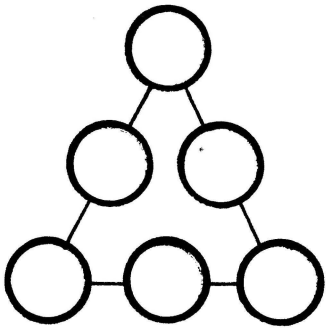

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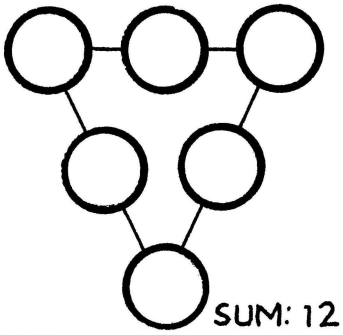
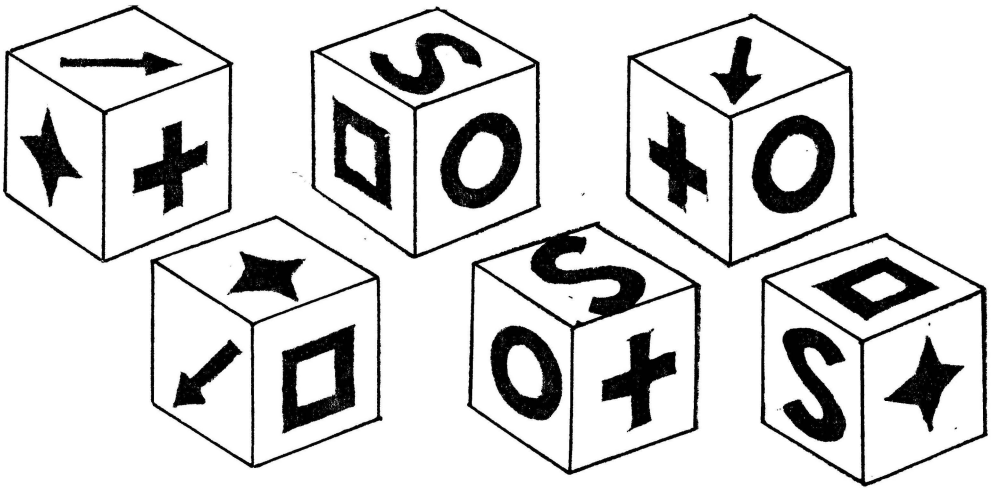


SUM: 12

HERE ARE SIX VIEWS OF THE SAME CUBE

WHICH FACE IS OPPOSITE WHICH?



PROBLEM SHEET 4

17 , 4 , 67 , 5 , 24 , 31 , 46 , 19
Split this set of numbers into two sets so that the totals of the numbers in the two sets are as close as possible.

Name three sports in which the winner finishes the event going backwards.

Two fathers and two sons went fishing. Each person caught a fish, but they only brought home three fish. How?

Is the number of people in the world who have shaken hands an odd number of times, odd or even?

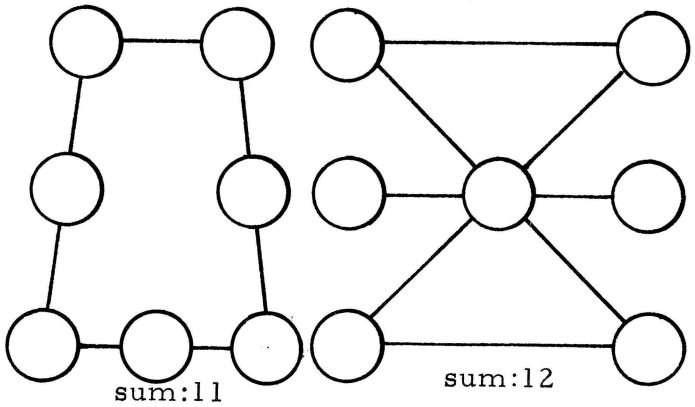
The other day I was asked if I could change a 50p piece. I had more than 50p in change, but I could not change 50p.
What is the largest amount that I could have had in my pocket?

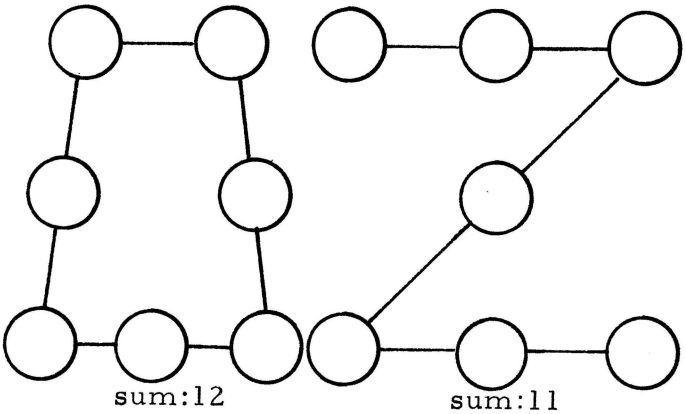
Three empty cereal boxes weigh 9 ounces, and each box holds 11 ounces of cereal. How much do 2 full boxes of cereal weigh?

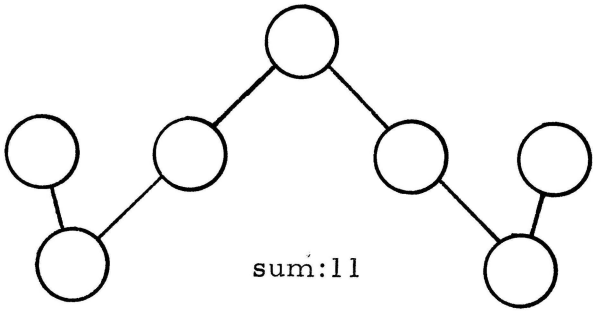
10 full crates of walnuts weigh 410 pounds, while an empty crate weighs 10 pounds.
What is the weight of walnuts in each crate?

What is the size of the smallest piece of paper that you need to make an envelope that would be big enough to hold this sheet?

Use the numbers 1 to 7 to solve these sum puzzles. Each straight line must sum to the number given at the bottom.







Friday the 13th is often called 'Black Friday'. How many 'Black Fridays' can you have in a year?

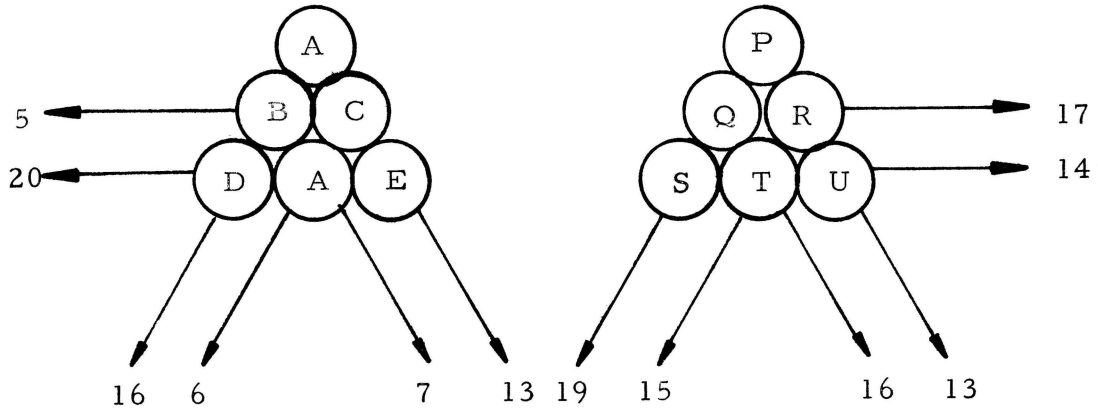
Three slices of bread are to be toasted under a grill. The grill can hold two slices at a time but only toasts one side at a time.
It takes 30 seconds to toast a slice on one side, 5 seconds to put in a piece or take out a piece and 3 seconds to turn a piece over.
What is the shortest time in which the three slices can be toasted?

Rose collects beetles, lizards and worms. She has more worms than beetles and lizards added together. Altogether in the collection there are 12 heads and 26 legs. How many lizards does Rose have?

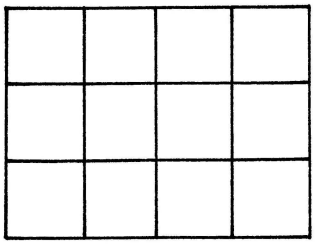
For each numbered statement, decide whether it is true or false:

1) Statement 2 in this list is true.
2) Statement 1 in this list is false.
3) Statement 3 in this list is false.
4) There are two misstakes in statement 4 in this list.

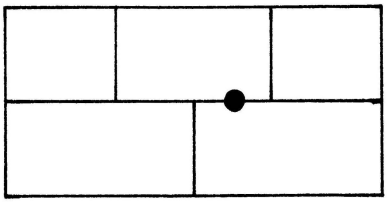
In the two diagrams below, each letter stands for a number.
Find out what the numbers in each circle must be so that the rows add up to the totals shown by the arrows.



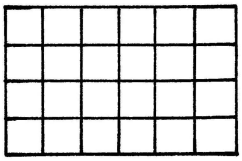
How many squares can you find in this diagram?



Beginning at the dot, draw a continuous line that crosses each segment of line exactly once.



A milk crate holds 24 bottles and is arranged like this:



Put 18 milk bottles into the crate so that <u>every</u> row and <u>every</u> column has an EVEN number of bottles in it.