1. A student multiplies the month and the day in which he was born by 31 and 12 respectively. The sum of the two resulting products is 170.
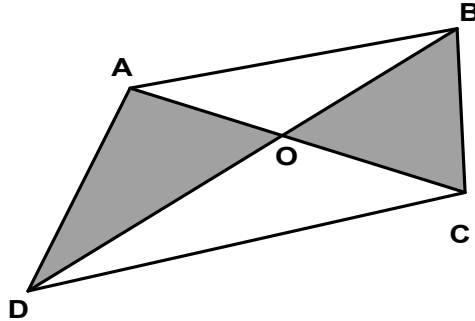Find the month and the date in which he was born.

2. Given that five whole numbers *a*, *b*, *c*, *d* and *e* are the ages of 5 people and that *a* is 2 times of *b*, 3 times of *c*, 4 times of *d* and 6 times of *e*, find the smallest possible value of $a+b+c+d+e$.

3. Lines *AC* and *BD* meet at point *O*.
   Given that $OA = 40$ *cm*, $OB = 50$ *cm*, $OC = 60$ *cm* and $OD = 75$ *cm*,
   find the ratio of the area of triangle *AOD* to the area of triangle *BOC*.

4. 1000 kg of a chemical is stored in a container.
   The chemical is made up of 99 % water and 1 % oil.
   Some water is evaporated from the chemical until the water content is reduced
   to 96 %.
   How much does the chemical weigh now?

5. A student arranges 385 identical squares to form a large rectangle without overlapping.
How many ways can he make the arrangement?

[Note: The arrangements as shown in figure (1) and figure (2) are considered the same arrangement.
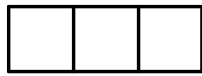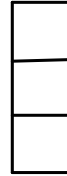

Figure (1)   Figure (2)]

6. A bag contains identical sized balls of different colours :
10 red, 9 white, 7 yellow, 2 blue and 1 black.
Without looking into the bag, Peter takes out the balls one by one from it.
What is the least number of balls Peter must take out to ensure that at least
3 balls have the same colour?

7. Find the value of $\dfrac{1\times5\times18+2\times10\times36+3\times15\times54}{1\times3\times9+2\times6\times18+3\times9\times27}$.

8. If the base of a triangle is increased by 10% while its height decreased by 10%, find the area of the new triangle as a percentage of the original one.

9. A box of chocolate has gone missing from the refrigerator.

The suspects have been reduced to 4 children.

Only one of them is telling the truth.

John : " I did not take the chocolate."

Wendy : " John is lying."

Charles: " Wendy is lying."

Sally : " Wendy took the chocolate."

Who took the chocolate ?

**10.** How many digits are there before the hundredth 9 in the following number

$$9797797779777797777797777779\ldots\ldots?$$

11. A particular month has 5 Tuesdays.
The first and the last day of the month are not Tuesday.
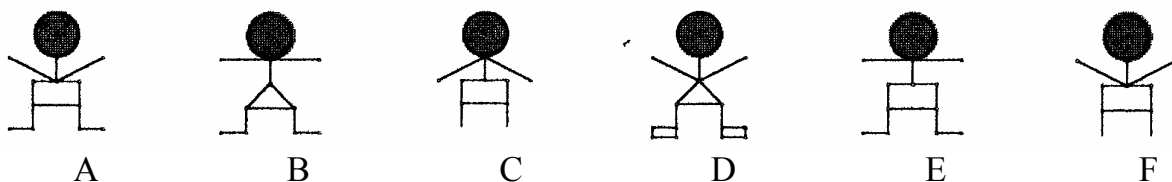What day is the last day of the month?

12. In the following division, what is the sum of the first 2004 digits after the decimal point?

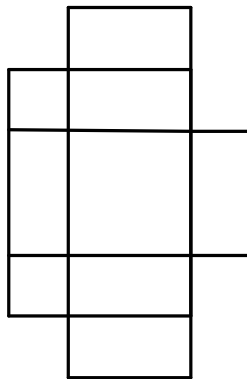$$2004 \div 7 = 286.285714285714......$$

13. A three digit number 5ab is written 99 times as 5ab5ab5ab……..5ab.
The resultant number is a multiple of 91.
What is the three digit number?

14.
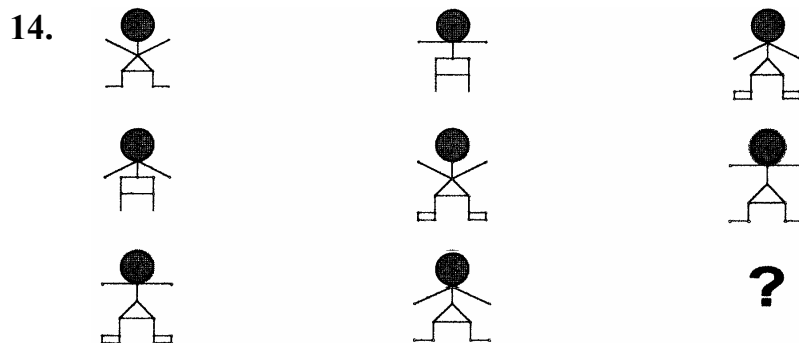
Which one of the following is the missing figure?

   A   B   C   D   E   F

15. How many rectangles are there in the following diagram?

16. Placed on a table is a mathematics problem,

$$89 + 16 + 69 + 9\Delta + \square 8 + 88$$

where each of the symbols Δ and $\square$ represents a digit.
Two students *A* and *B* sit on the opposite sides of the table facing each other.
They read the problem from their directions and both get the same answer.
What is their answer?

17. Find the value of $\dfrac{1}{4\times9}+\dfrac{1}{9\times14}+\dfrac{1}{14\times19}+...+\dfrac{1}{1999\times2004}$.

18. The diagram shows a right-angled triangle formed from three different coloured papers.
The red and blue coloured papers are right-angled triangles with the longest sides measuring 3 cm and 5 cm respectively.
The yellow paper is a square.
Find the total area of the red and blue
coloured papers.
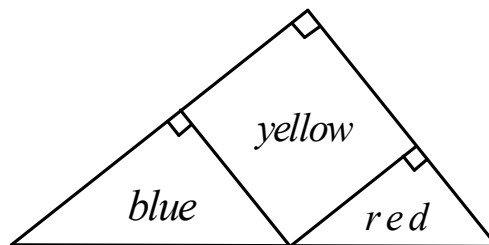
19. The diagram shows a circular track with **AB** as its diameter.
Betty starts walking from point **A** and David starts from point **B**.
They walk toward each other along the circular track.
They meet at point **C** which is 80 m from **A** the first time.
Then, they meet at point **D** which is 60 m from **B** the second time.
What is the circumference of the circular track?
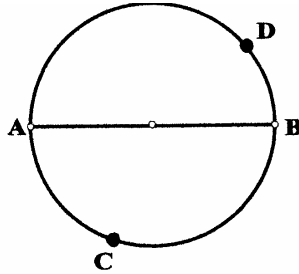
20. A triangle, figure (1), is folded along the dotted line to obtain a figure as shown in figure (2).
The area of the triangle is 1.5 times that of the resulting figure.
Given that the total area of the three shaded regions is 1 unit^2,
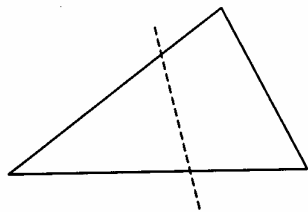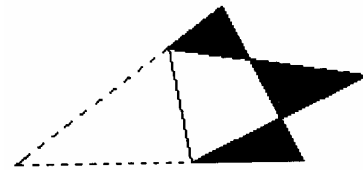find the area of the original triangle.

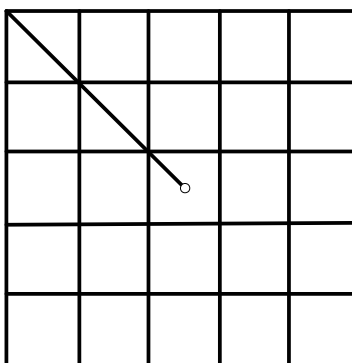Figure (1)   Figure (2)

21. What is the missing number in the following number sequence?

$$2, 2, 3, 5, 14, \boxed{}, 965.$$

22. The figure shown in the diagram below is made up of 25 identical squares.
A line is drawn from one corner of the figure to its centre.
On the answer sheet provided, show how to add in 4 more non-parallel lines so as
to divide the figure into 5 equal areas.

23. There are three bowls on a table, each containing different types of fruits.

  To the right of the green bowl is the banana.
  To the left of the banana is the orange.
  To the right of the star-fruit is the green bowl.
  To the left of the white bowl is the blue bowl.
What is the colour of the bowl containing the orange?

[Note: The "right" or "left" here do not necessarily refer to the immediate right
     nor immediate left.]

24. At 7.00 am, a vessel contained 4000 cm^3 of water.
Water was removed from the vessel at a constant rate of 5 cm^3 per minute.
At 8.00 am, 80 cm^3 of water was added.
A further 80 cm^3 was added at the end of each hour after that.
Find the time when the vessel was empty for the first time.

25. A car travels from town **P** to town **Q** at a constant speed.
When it increases its speed by 20%,
the journey from **P** to **Q** takes 1 hour less than its usual time.
When it travels at its usual speed for 100 km before increasing its speed by 30%,
the journey also takes 1 hour less than usual.
Find the distance between the two towns.

26. A piece of pasture grows at a constant rate everyday.

200 sheep will eat up the grass in 100 days.
150 sheep will eat up the grass in 150 days.

How many days does it take for 100 sheep to eat up the grass?

27. The digits 3, 4, 5 and 7 can form twenty four different four digit numbers. Find the average of these twenty four numbers.

28. The vertical diameter of a circle is shifted to the right by 3 cm and the horizontal diameter is shifted up by 2 cm as shown in the diagram below.
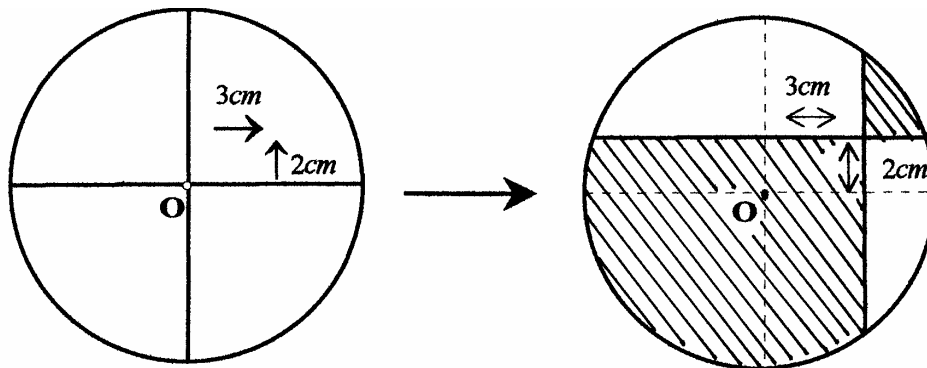
Find the difference between the shaded and the unshaded areas.

29. The Sentosa High School's telephone number is an eight digit number.
The sum of the two numbers formed from the first three digits and
the last five digits respectively is 66558.
The sum of the two numbers formed from the first five digits and
the last three digits is 65577.
Find the telephone number of The Sentosa High School.

30. A confectionery shop sells three types of cakes.
Each piece of chocolate and cheese cake costs $5 and $3 respectively.
The mini-durian cakes are sold at 3 pieces a dollar.
Mr Ng bought 100 pieces of cakes for $100.
How many chocolate, cheese and durian cakes did he buy?
 Write down all the possible answers.

THE END