Name : _____ (   )   23 Aug 2006

Class : P 6 _____

CATHOLIC HIGH SCHOOL

PRIMARY SIX

PRELIMINARY EXAMINATION

MATHEMATICS

BOOKLET A

15 questions

20 marks

Total Time: 2h 15 min

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Follow all instructions carefully.

Answer all questions.

Questions **1** to **10** carry 1 mark each. Questions **11** to **15** carry 2 marks each.
For each question, four options are given. One of them is the correct answer.
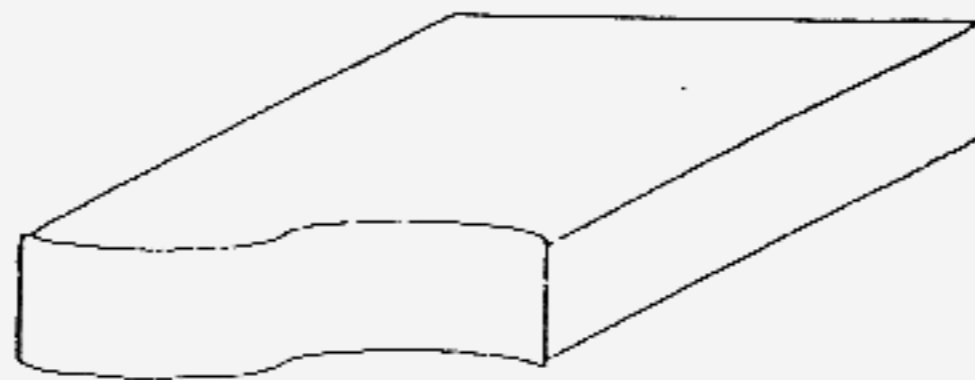Make your choice (1, 2, 3 or 4). Shade the correct oval on the Optical Answer Sheet.
(20 marks)

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1. By how much would the number 43 975 decrease if the digit 9 is replaced by 2?

   (1)   7
   (2)   70
   (3)   700
   (4)   7000

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2. ABCD is a square of side 6 cm. Find the area of the shaded region.
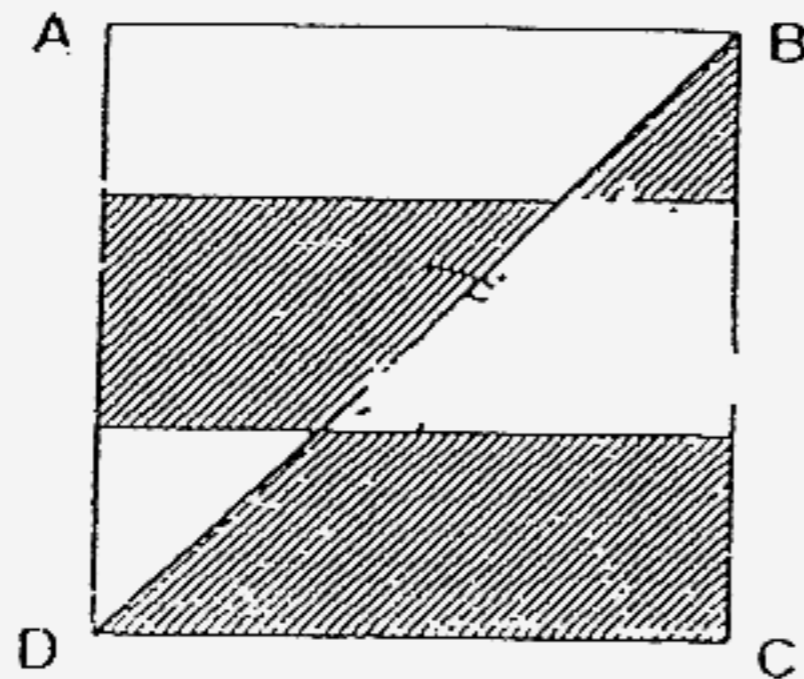
   (1)   18 cm²
   (2)   27 cm²
   (3)   36 cm²
   (4)   81 cm²

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3. In the figure shown below, how many faces does the solid have?

   (1)   5
   (2)   6
   (3)   7
   (4)   8

(Go to the next page)
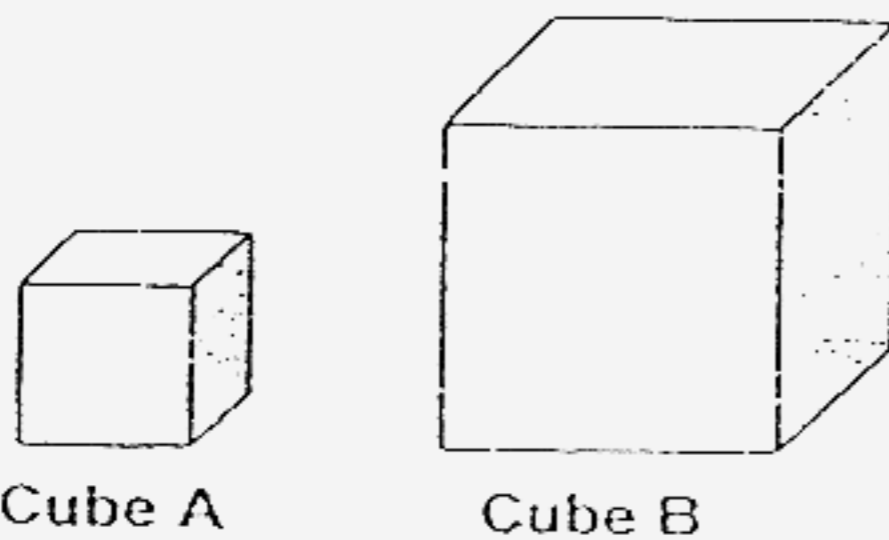
Which one of the following numbers is the largest?

(1)   8.4

(2)   8.05

(3)   8.39

(4)   8.049

---

5.   Simplify $15r + 9 - 8r + 2$.

(1) $7r + 7$

(2) $7r + 11$

(3) $23r + 7$

(4) $23r - 11$

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6.   The side of Cube A is 4 cm. The side of Cube B is twice that of Cube A. Find the ratio of the volume of Cube A to Cube B.
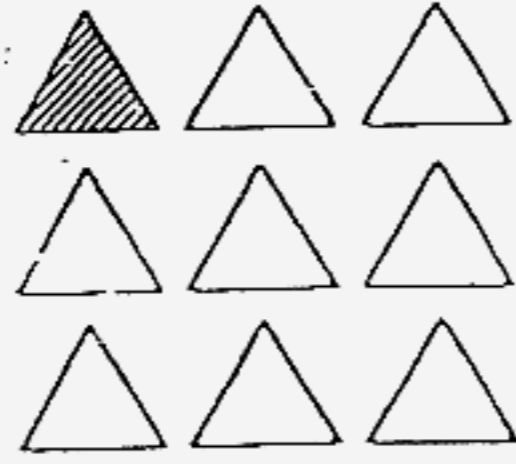

Cube A   Cube B

(1) $1 : 1$

(2) $1 : 2$

(3) $1 : 4$

(4) $1 : 8$

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7.   Benjamin bought 45 stamps on Monday, 45 stamps on Tuesday and 48 stamps on Wednesday. What was the average number of stamps he had bought on the three days?
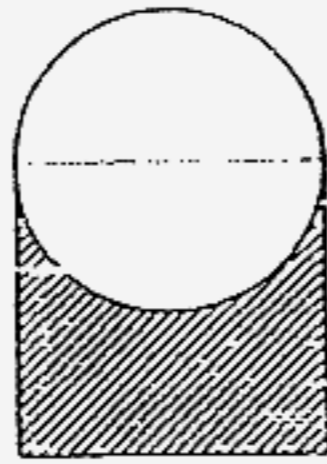
(1)   45

(2)   46

(3)   69

(4)   138

8. In the figure, how many **more** triangles must be shaded so that the number of shaded triangles to the total number of triangles is 2 : 3?

(1) 1
(2) 2
(3) 5
(4) 6

9. The figure below, not drawn to scale, is made up of a square and a circle of diameter 14 cm. Taking $\pi = \frac{22}{7}$, calculate the perimeter of the shaded region.

(1) 42 cm
(2) 56 cm
(3) 64 cm
(4) 119 cm

10. Mr. Tan gives $\frac{1}{3}$ of his salary to his wife. He spends y of his salary on transport and saves the rest. If he earns $3 000 a month, how much does he save monthly?
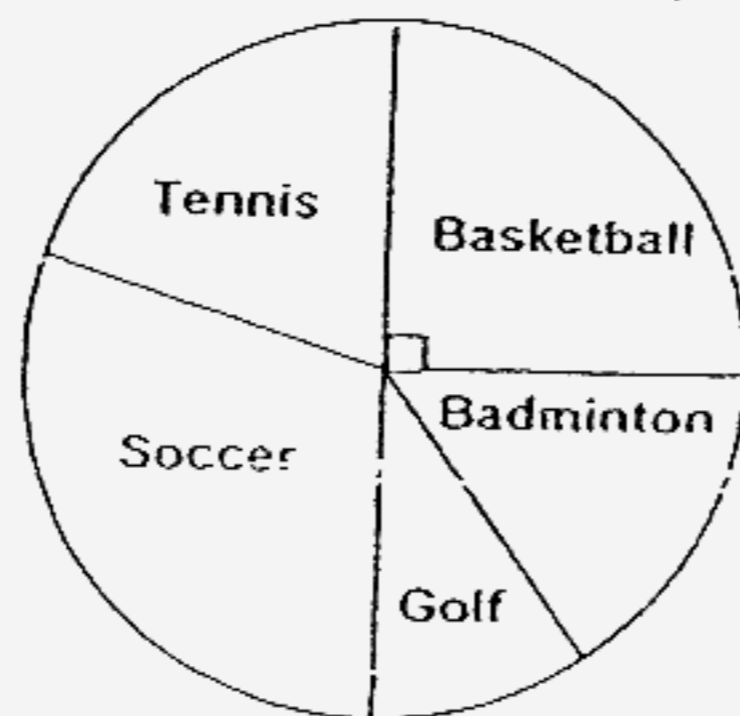
(1) $ (y − 1 000)
(2) $ (y + 1 000)
(3) $ (2 000 − y)
(4) $ (3 000 − y)

(Go to the next page)

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11. $\frac{1}{4}$ of Shaun's money is $\frac{1}{3}$ of Jason's money.

Express Shaun's money as a fraction of Jason's money.

    (1) $\frac{3}{7}$

    (2) $\frac{3}{4}$

    (3) $\frac{4}{7}$

    (4) $\frac{4}{3}$

12. 40 pupils were asked for their favourite sport. The table below represents their choices. Study the table and answer the question that follows.

If 6 pupils chose badminton, how many pupils have golf as their favourite sport?

    (1)   6
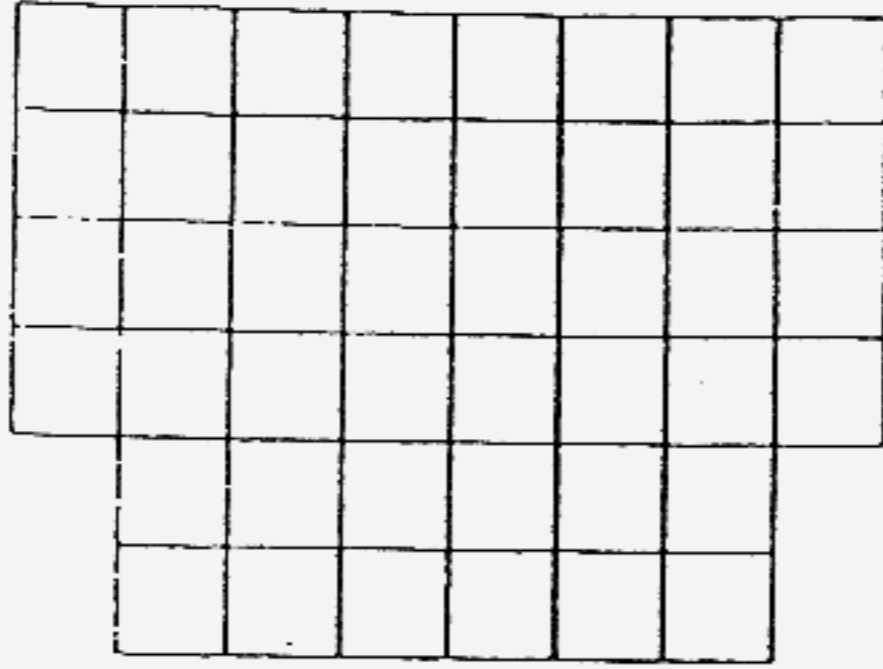
    (2)   10

    (3)   20

    (4)   4

13. The figure below is made up of two identical small circles and a larger circle with radius 20 cm. Taking $\pi = 3.14$, find the ratio of the shaded area to unshaded area.

    (1)   1 : 1
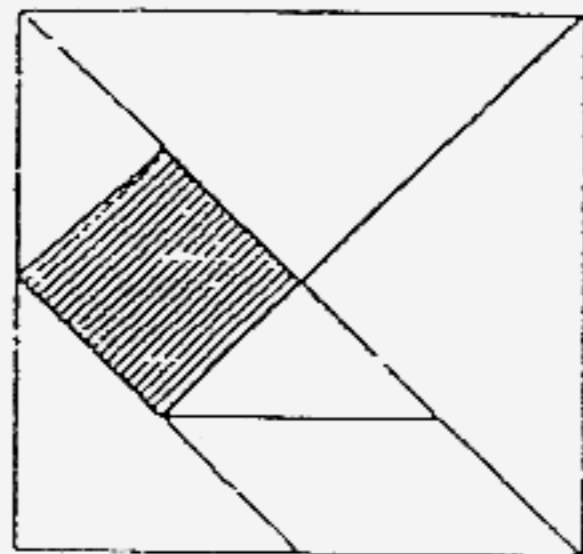
    (2)   1 : 2

    (3)   1 : 3

    (4)   1 : 4
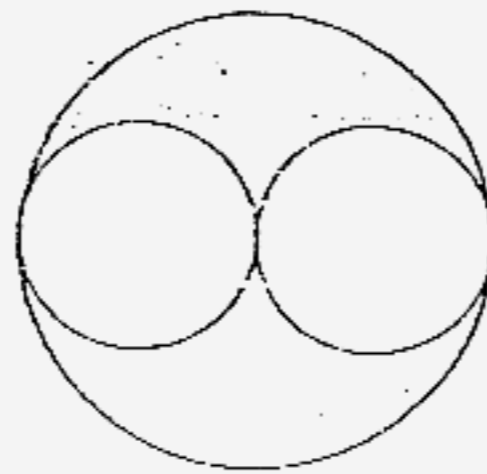
14. John cuts the whole piece of grid paper as shown below into square pieces. If there is no wastage, what is the least number of square pieces he can cut out?

(1) 5
(2) 2
(3) 11
(4) 44

15. What fraction of the figure below is shaded?

(1) $\dfrac{1}{7}$

(2) $\dfrac{1}{8}$

(3) $\dfrac{1}{9}$

(4) $\dfrac{1}{10}$

Questions 16 to 25 carry 1 mark each. Write your answers in the space provided. For questions which require units, give your answers in the units stated. (10 marks)
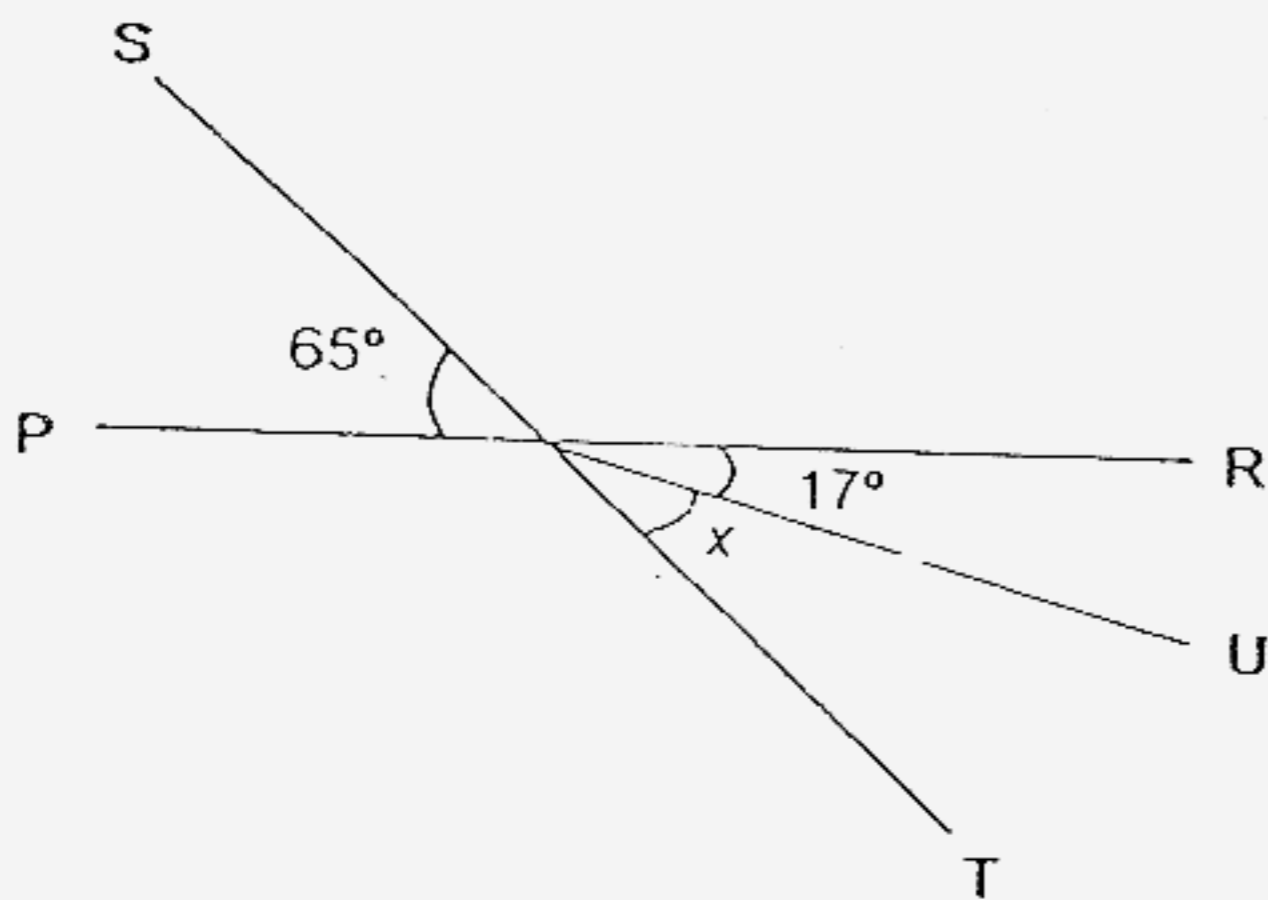
16. If $\frac{2}{5}$ of a number is 12, what is $\frac{1}{2}$ of the number?

Ans : _____

17. Find the value of $\frac{3}{5} \div 15$. (Give your answer in its simplest form.)

Ans : _____

18. In the figure, not drawn to scale, PR and ST are straight lines. Calculate $\angle x$.

Ans : _____ °

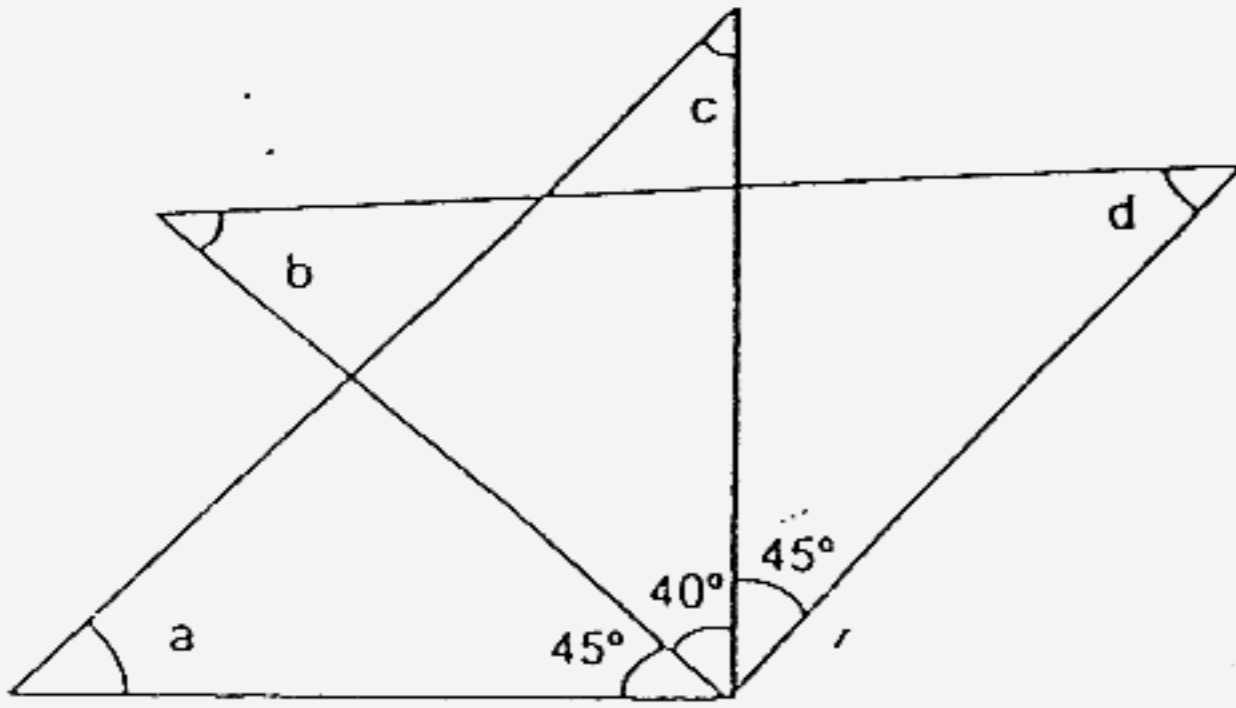19. Write 2.15 p.m. using the 24-hour clock.

Ans : _____

SCORE

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20.   7 km 3 m is the same as _____ km.

Ans : _____ km

21.   The figure below is not drawn to scale. Find the sum of ∠a + ∠b + ∠c + ∠d.
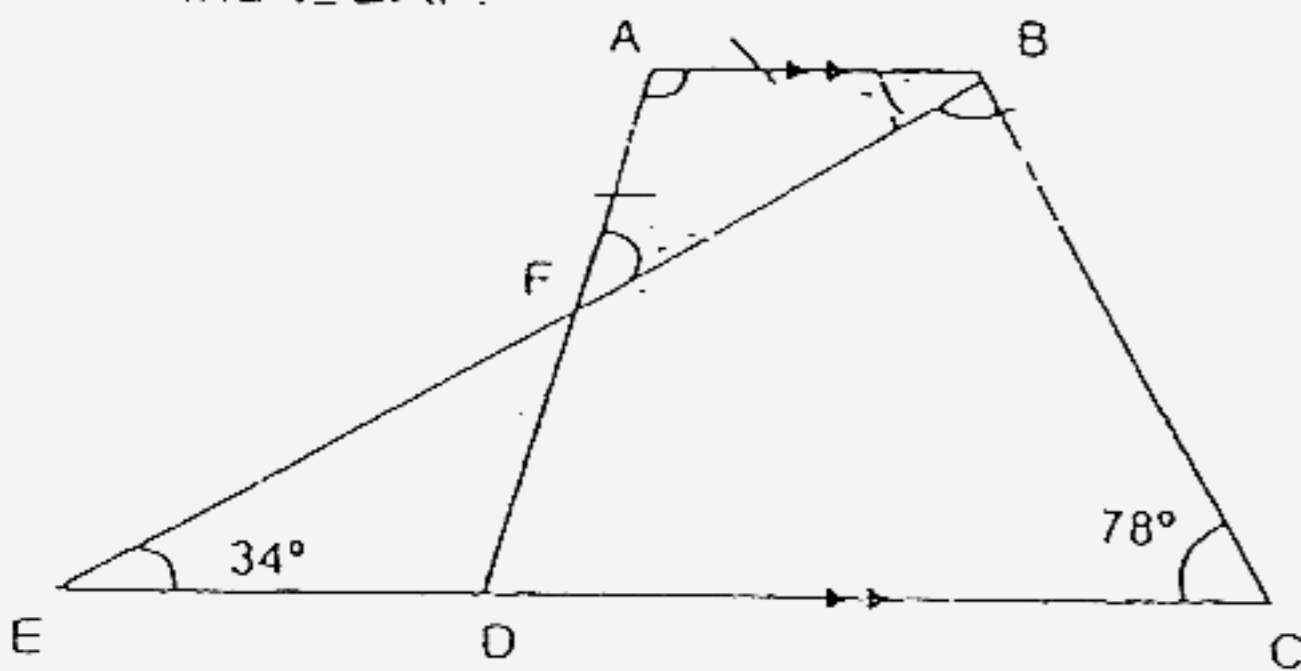

22.   There were 300 red and green ribbons in the box. If 0.2 of them were green
ribbons, how many red ribbons were there?

Ans : _____ red ribbons

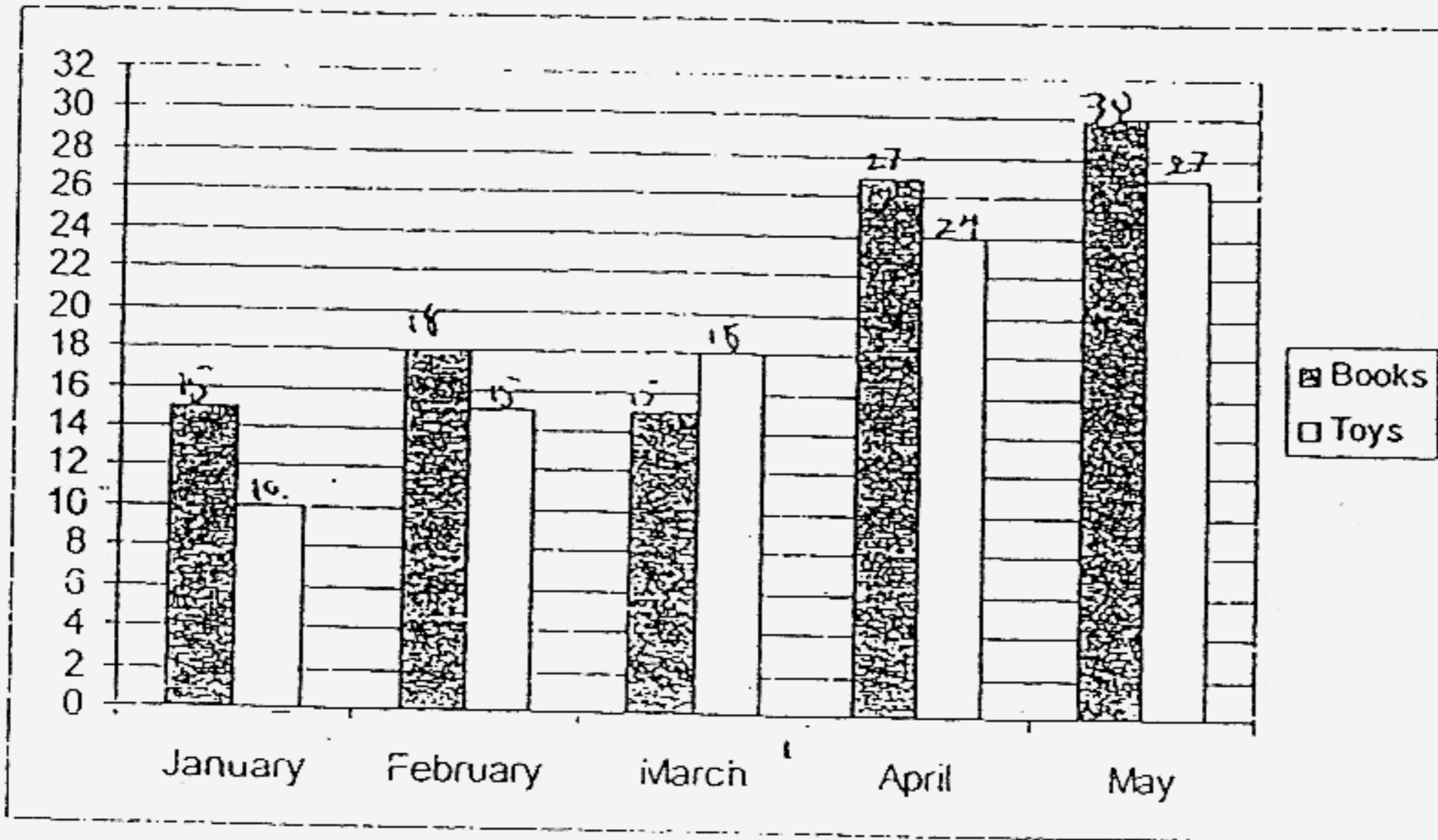23.   In the figure below, AFD, EFB and EDC are straight lines and AF = AB.
Find ∠BAF.

The bar graph below shows the number of books and toys sold by a bookstore over a period of five months.
Use the graph to answer questions 24 and 25.

24. In which month was the ratio of the number of books to the number of toys sold 9 : 8?

Ans:_____

25. What was the percentage increase in the number of books sold from January to February?

Ans :_____ %

SCORE

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Questions 26 to 35 carry 2 marks each. Show your working clearly in the space below each question and write your answers in the spaces provided. For questions which require units, give your answers in the units stated. (20 marks)

26. The figure below is made up of a square and three identical semi-circles.

Taking $\pi = 3.14$, calculate the perimeter of the shaded region.
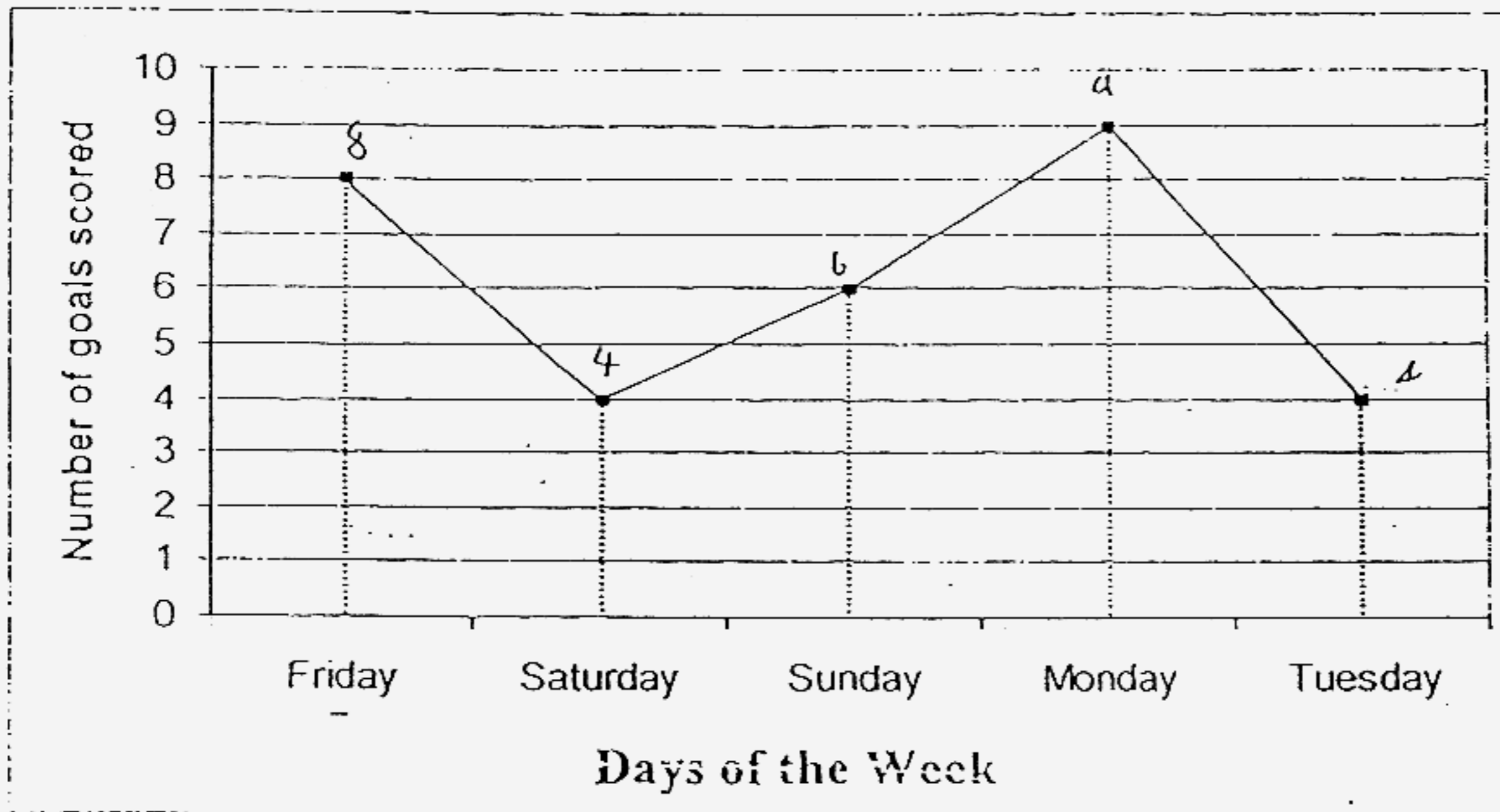

10 cm
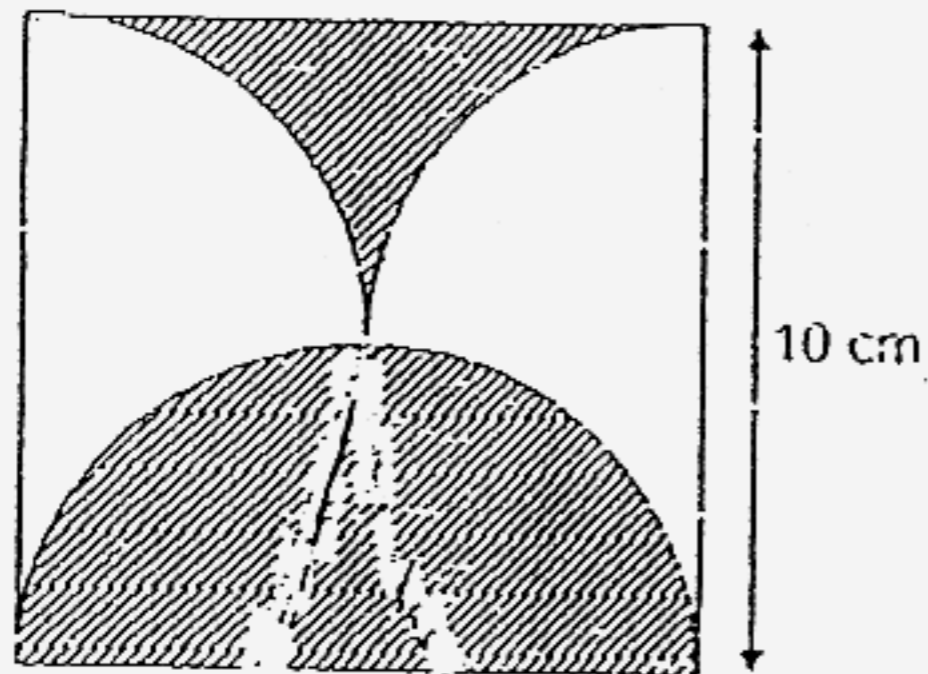
Ans :_____ cm

27 Kenneth wants to rent a bicycle from Jim's Bicycle Kiosk.

The cost (C) of renting a bicycle for d hours is given by $C = \$(3d + 5)$.

Find the cost of renting the bicycle if Kenneth wants to cycle for 4 hours.

Ans $ _____

SCORE

The line graph snows the number of goals scored in the first five days of the FIFA World Cup. Study the graph and answer the question that follows.

28   What was the average number of goals scored per day?

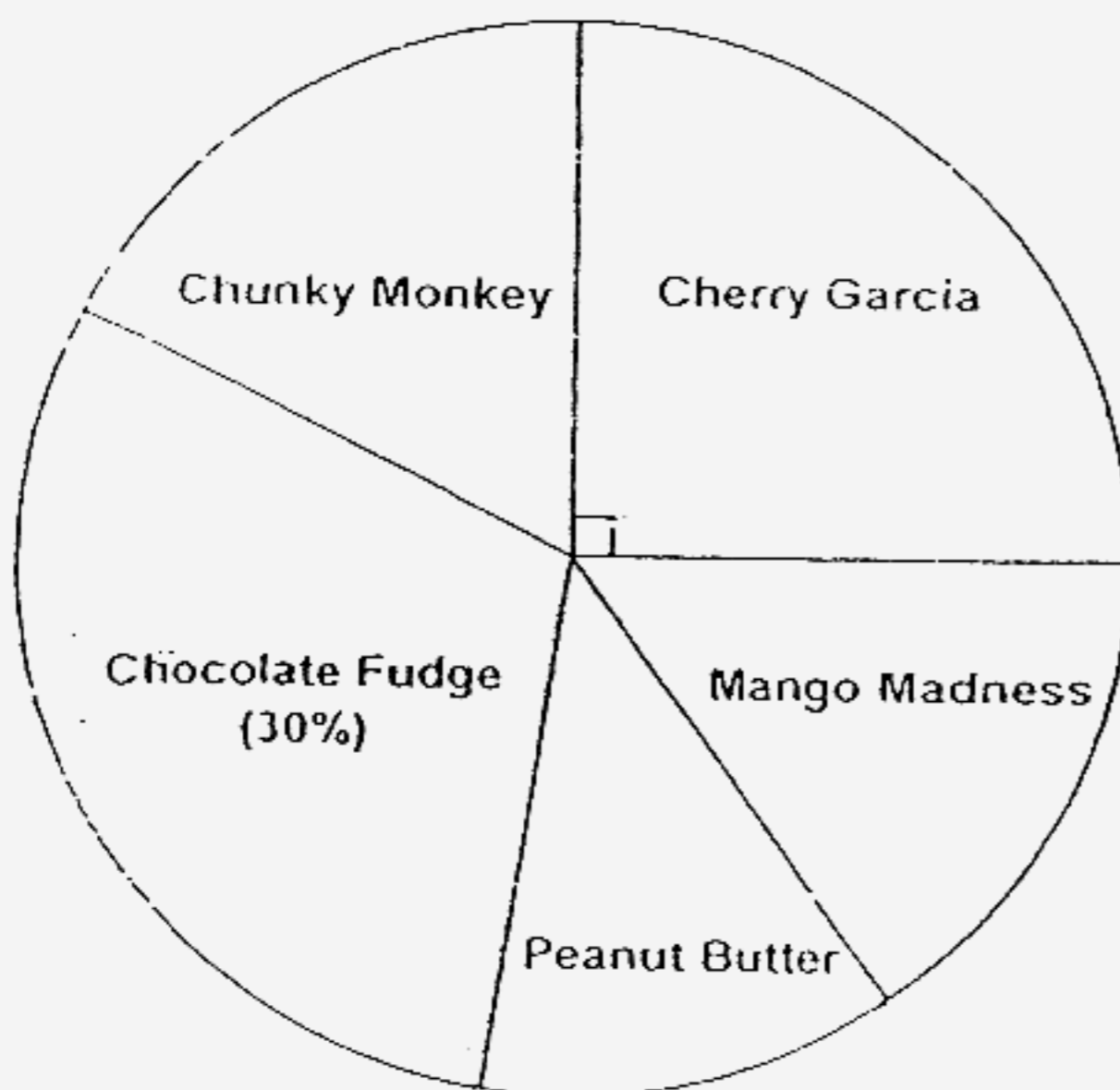Ans _____

29. Alan has enough money to buy either 18 pencils or 15 pens.

If he buys 12 pencils, how many pens can he buy with the remaining money?

Ans : _____

30. A group of 200 pupils were asked to choose the flavour of ice-cream they like. The pie chart below represents their choices. How many more people like Chocolate fudge than Cherry Garcia?

Ans .

SCORE

31. The length and breadth of a rectangle is 10 cm and 5 cm respectively. If the length is increased by 20%, what is the new area of the rectangle?
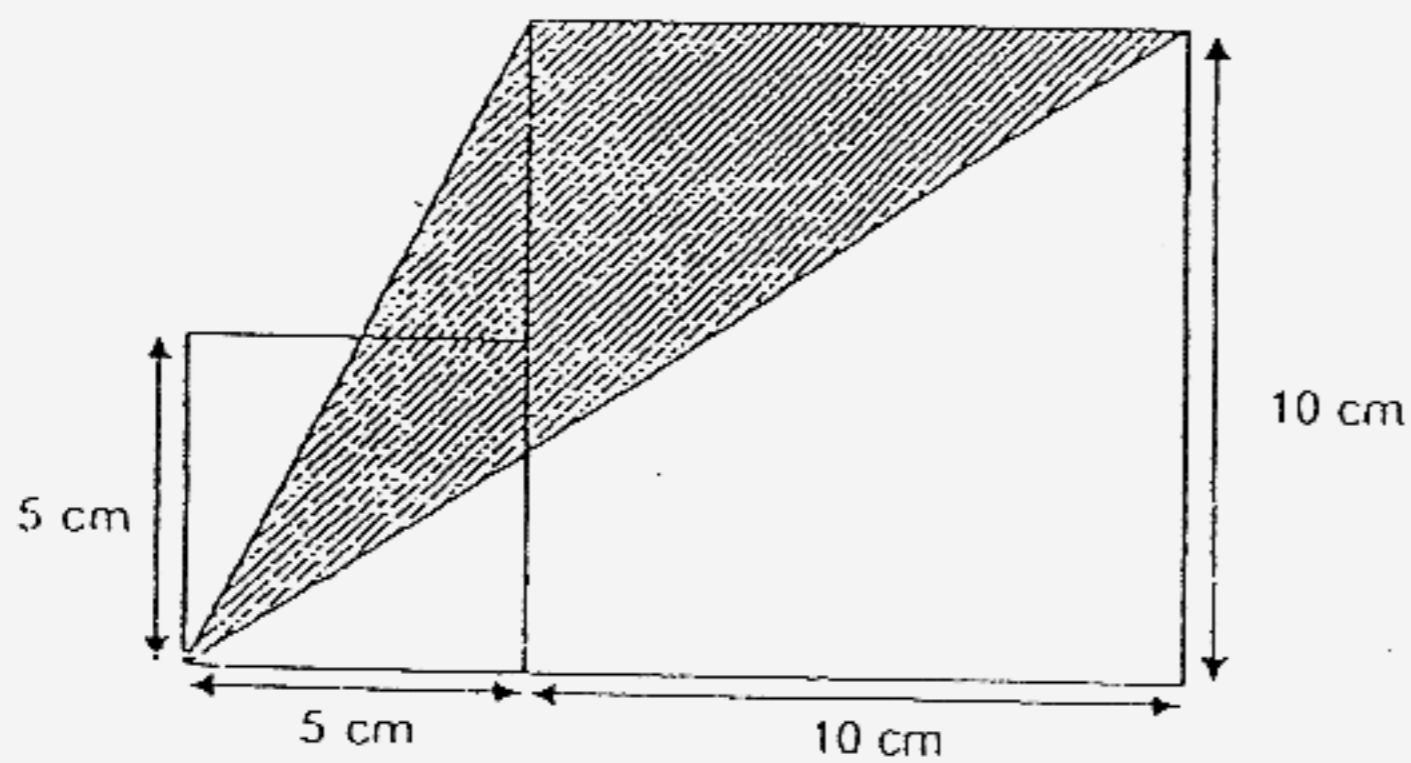
Ans : _____ cm²

32. Mr Koh travelled from Town A to Town B in 5 hours at an average speed of 80 km/h. His average speed for the first $\frac{3}{8}$ of the journey was 75 km/h. How long did he take to finish the remaining part of the journey?
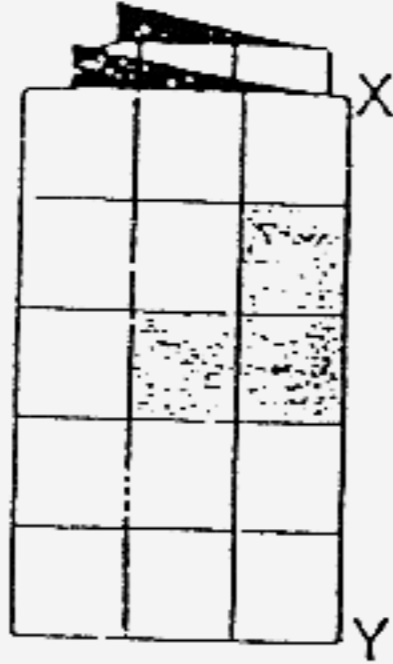
Ans : _____ h

33. Find the area of the shaded region.

5 cm

10 cm

5 cm   10 cm

Ans _____ cm²

SCORE _____

12

34. A piece of paper is folded in half and then each half is folded in half again as shown. The following shape is then cut out of the paper while folded.

The sheet is then smoothed out to its original size again.

In the space below, draw the pattern as it will appear.

The line XY shows the fold where it was cut.
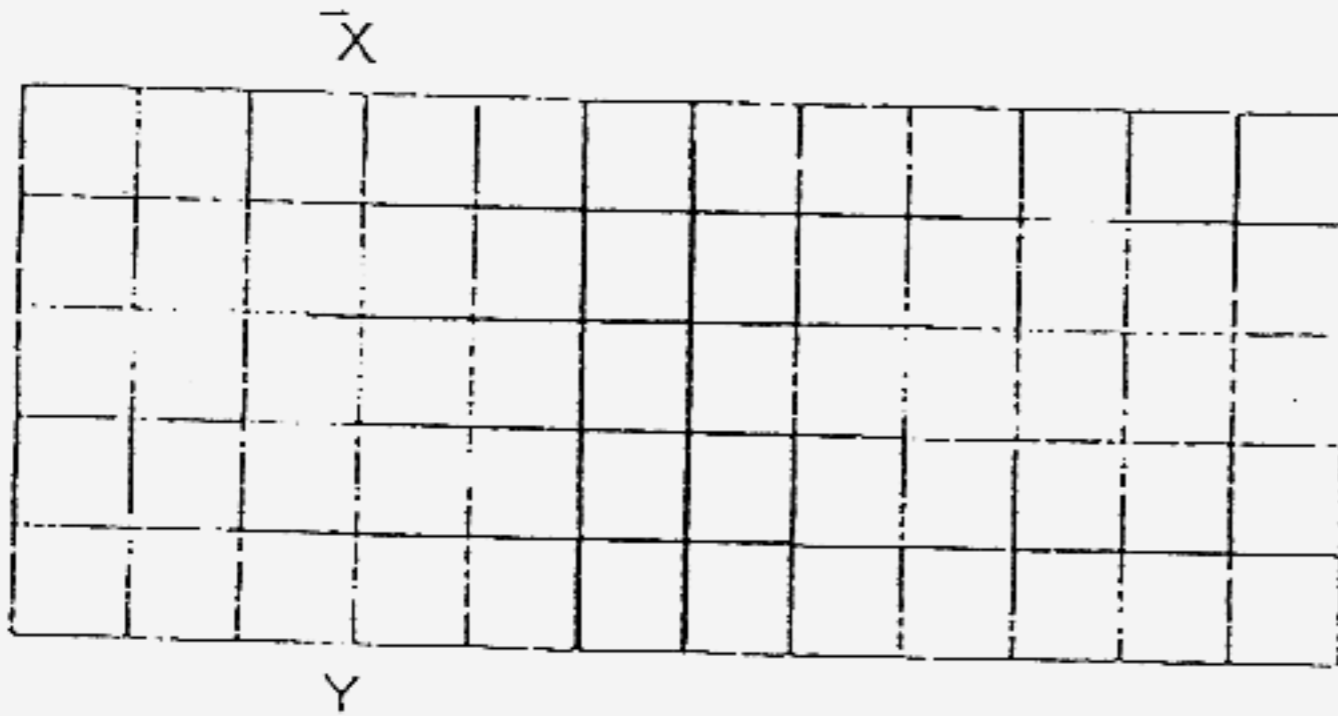
35. A rectangular tank measuring 20 cm by 20 cm by 10 cm was being filled. A tap delivered water into the tank at 140 cm³ per minute.
If there was a leak in the tank and water flowed out at 40 cm³ per minute, how long did it take to fill the tank completely?

Ans _____ minutes

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For questions 36 to 48, show your working clearly in the space provided for each question and write your answers in the spaces provided. The number of marks available is shown in brackets [ ] at the end of each question or part-question. (50 marks)
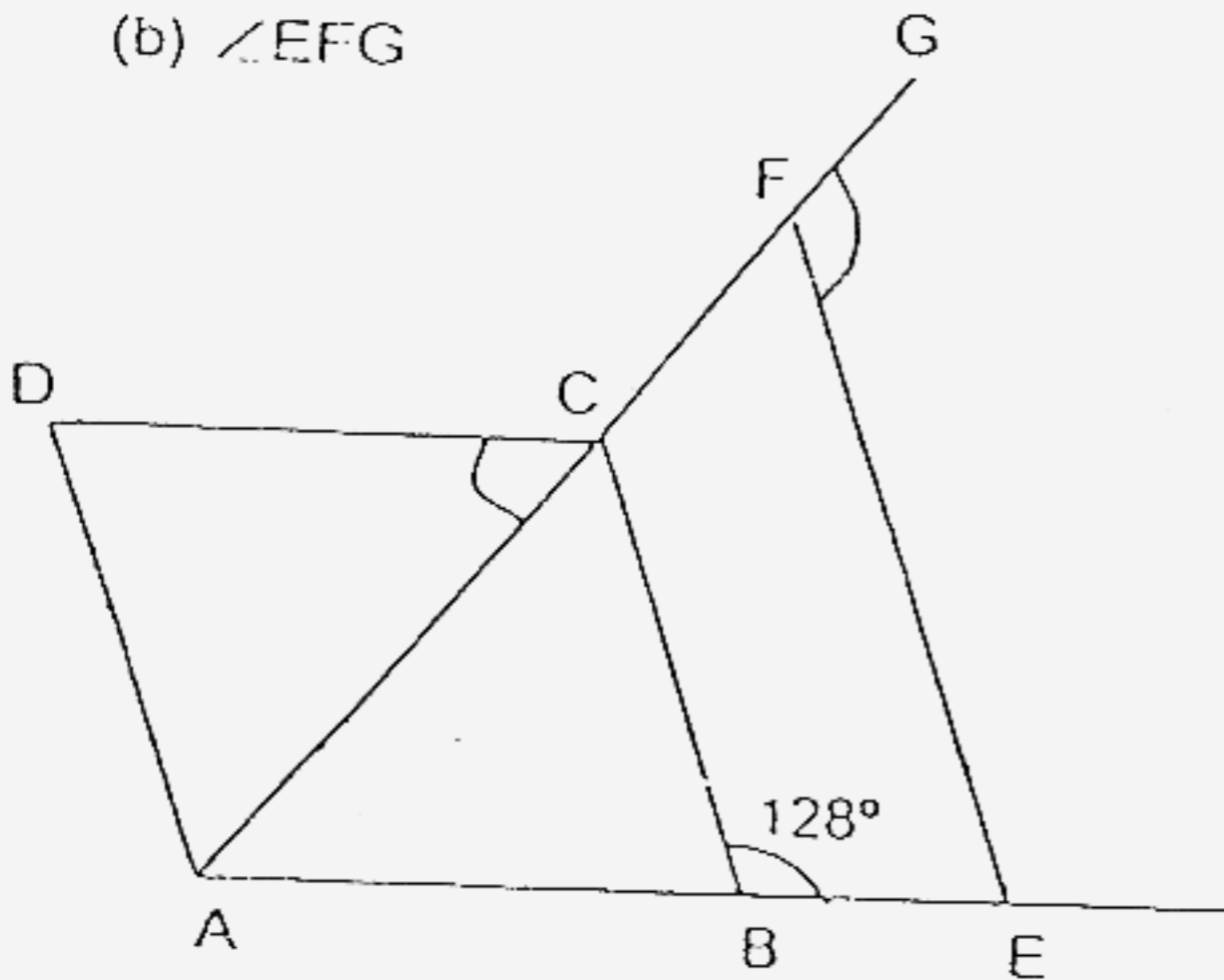
Do not write in this space

36.   There are 45 boys in a campsite.

Out of these boys, 17 of them like cycling, 14 of them like swimming and

10 of them like both cycling and swimming.

How many boys do not like cycling and swimming?

Ans: _____ [3]

37.   In the figure, BC//EF. ABCD is a rhombus. Find the values of

(a) $\angle ACD$

(b) $\angle EFG$

Ans: $\angle ACD =$ _____ [2]

$\angle EFG =$ _____ [1]

SCORE

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38. The figure shows two straight lines XY and YZ.

X

Y   Z

(a)   Measure and write down the size of ∠XYZ.

(b)   Lines XY and YZ are two sides of a parallelogram.

Draw the parallelogram by completing the figure above.

Ans : (a) _____ [1]
      (b) ____See above____ [2]

39.   There are 1800 pupils in a school. The number of girls is 200 more than

the number of boys. How many percent more girls than boys are there?

Ans : _____ [3]

40. (a) How many of the letters shown below have lines of symmetry?

A S N G H O

Ans: a) _____ [1]

(b) Extend the tessellation by drawing three more unit shape in the space provided below. [2]
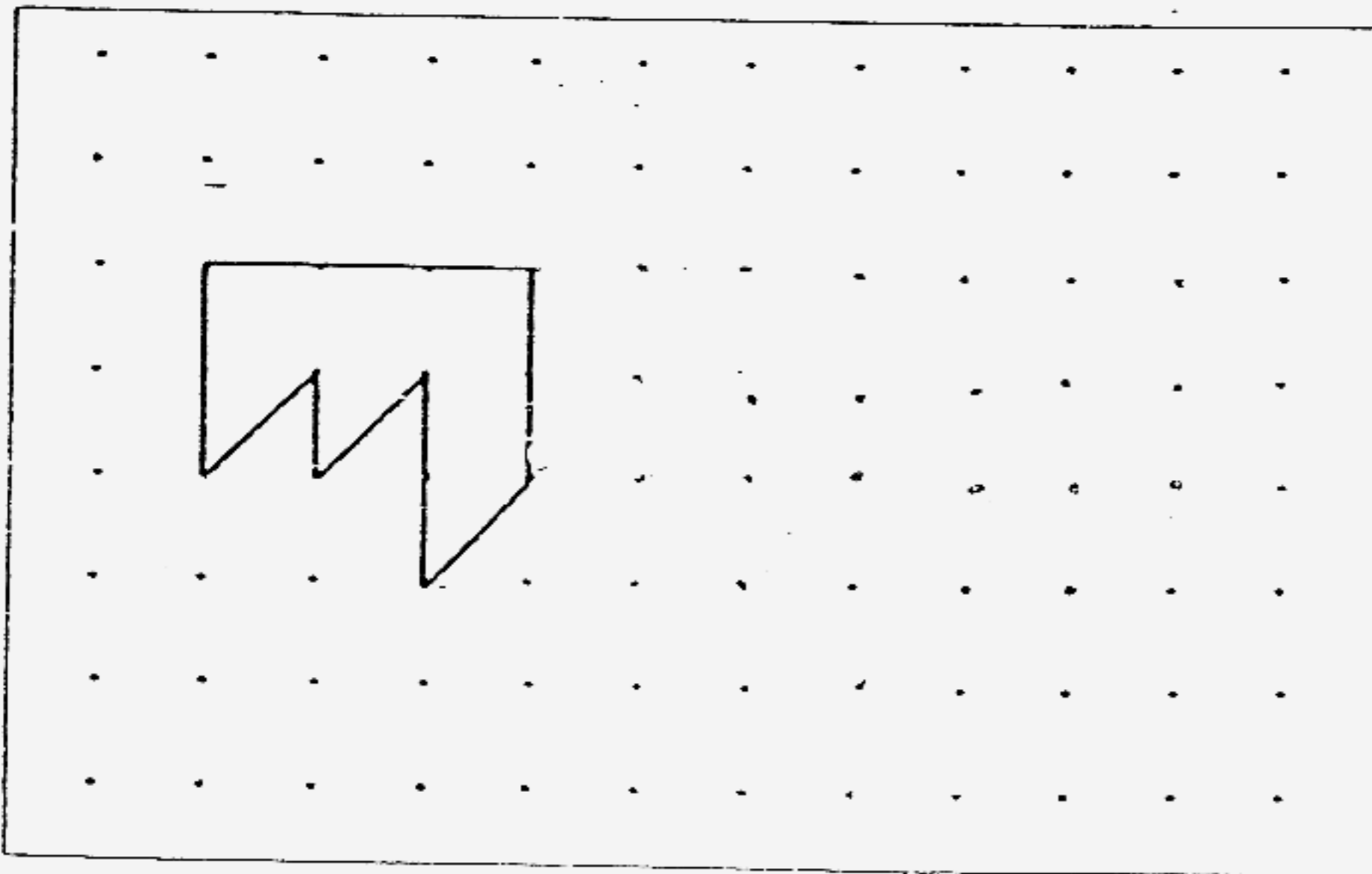
SCORE

41. In the figure below, not drawn to scale, the square, ABCD, is made up of four rectangles. Given that the area of the square ABCD = 144 cm², area of rectangle DFHG = 20 cm² and the area of rectangle AEHG = 28 cm², find the area of rectangle EBIH.

42. It takes Martin 5 hours to fix a jigsaw.

If Jeremy helps him, they would take 3 hours to fix the jigsaw together.

How long will Jeremy take to fix the jigsaw by himself?

Ans _____ [4]

SCORE

43.   At 7.30 am, Hubert left Johor, travelling towards Kuala Lumpur at a constant speed. 1 hour later, Joshua started travelling from Johor on the same road. Joshua overtook Hubert at 11.30 am. The speed at which Joshua was travelling at was 20km/h faster than Hubert and he arrived at Kuala Lumpur at 12.30pm. Find the distance between Johor and Kuala Lumpur.

Ans:_____ [4]

SCORE

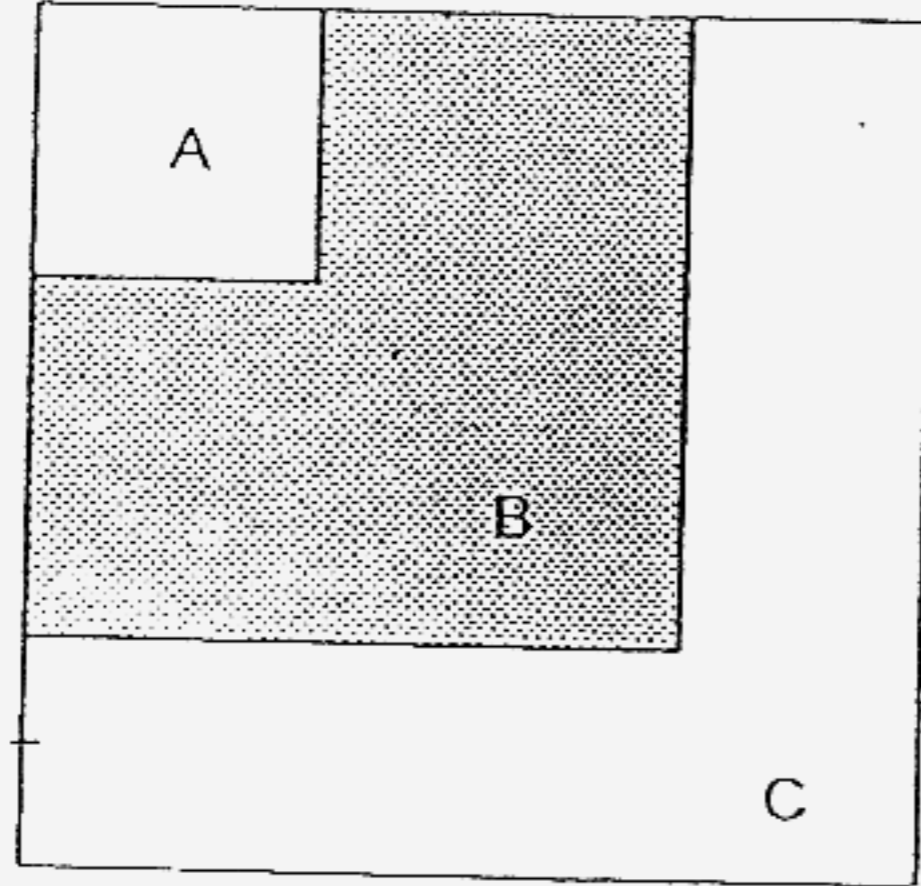44. The figure is made up of three squares A, B, and C that overlaps each other. The area of square A is 20% that of square B, where the area of square B is 60% that of square C.

What is the ratio of the shaded area to the unshaded area?

Ans: _____ [4]

45. The figure below, not drawn to scale, is made up of semi-circles and circles. Given that the diameter of the large semicircle is 42 cm, find the area of the shaded region and express your answer as a fraction in the lowest term.

(Take $\pi = \dfrac{22}{7}$)

42cm
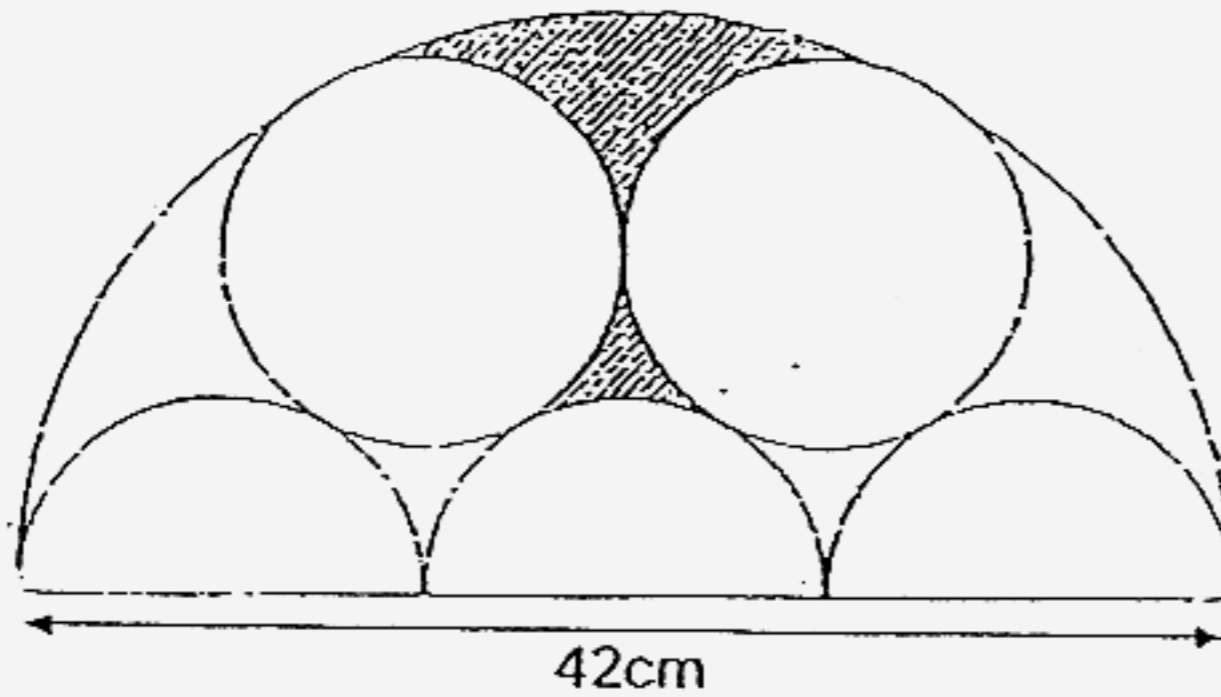
Ans: _____ [4]

SCORE

46. Mary and Jane bought some utensils consisting of forks and spoons from a departmental store.

    Jane bought $\frac{2}{5}$ of the total utensils.

    Altogether, they bought 30 more spoons than forks.

    Mary bought $\frac{2}{3}$ of the spoons and $\frac{1}{2}$ of the forks.

    How many utensils did Jane buy?

Ans: _____[5]

SCORE

Camp A was for girls whereas Camp B was for boys.

There were $\frac{2}{5}$ as many girls as boys.

Midway, more pupils joined both camps and for every 2 additional girls who joined Camp A, 1 additional boy joined Camp B.

Given that there is an equal number of boys and girls in the end, how many boys joined Camp B midway?

Ans: _____ [5]

SCORE

23

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The diagram below shows 3 figures formed by shaded and unshaded triangles.
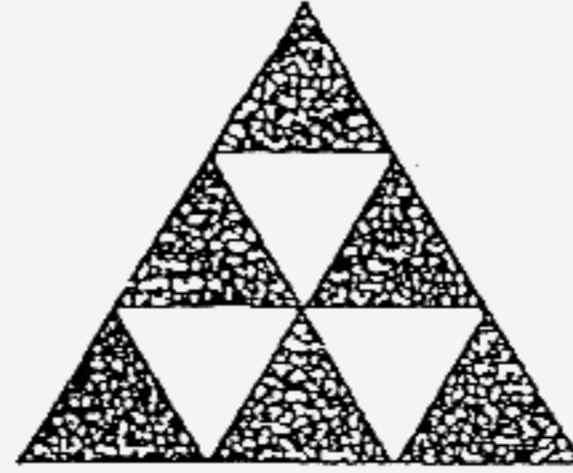
Figure 1   Figure 2   Figure 3

a) Complete the column for Figure 5 in the table below.   [2]

Figure	1	2	3		5
Total Number of triangles	1	4	9		
Number of Shaded Triangles	1	3	6		

b) Find the total number of triangles in Figure 15.   [1]

c) How many shaded triangles are there in figure 30?   [2]

Ans: (a) _____See above_____ [2]

(b) _____ [1]

(c) _____ [2]

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Q1	Q2	Q3	Q4	Q5
3	1	2	1	2
Q6	Q7	Q8	Q9	Q10
4	2	3	3	3
Q11	Q12	Q13	Q14	Q15
4	4	1	1	2

16. 15

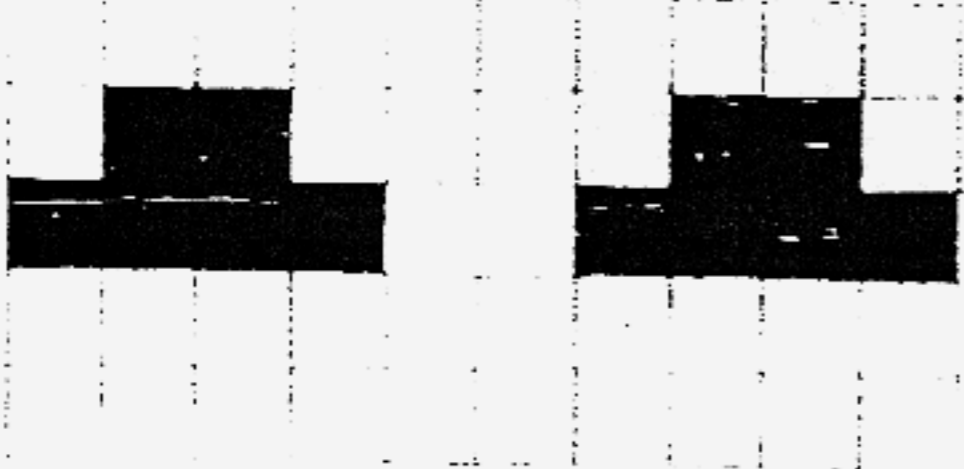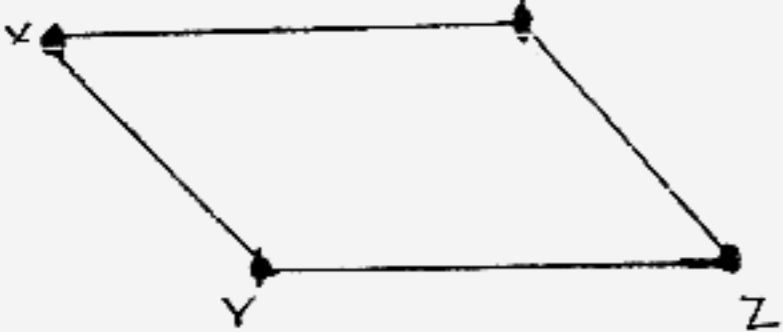17. $\dfrac{1}{25}$

18. 48°

19. 1415

20. 7.003

21. 190°
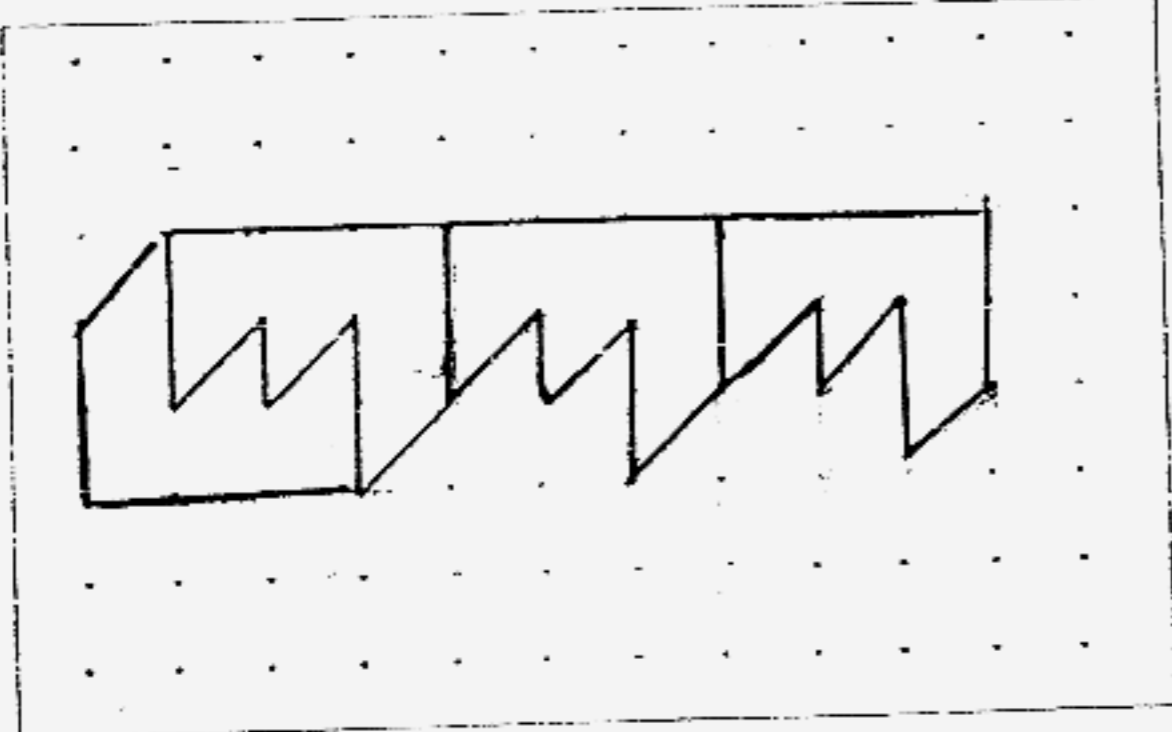
22. 240

23. 112°

24. April

25. 20

26.	3.14 x 10 = 31.4cm 31.4 + 10 + 10 = 51.4cm	27.	$4 \times \$\left(\dfrac{3d-5}{d}\right)$ $= \$\dfrac{4(3d-5)}{d}$
28.	8 + 4 + 6 + 4 + 9 = 31 31 ÷ 5 = 6.2	29.	18 pencils = 15 pens 12 pencils = 5 x 2 = 10 pens = 15 − 10 = 5 pens
30.	100% = 200 5% = 10	31.	100% = 10cm 120% = 12cm = 12 x 5 = 60cm²
32.	8u = 80km/hr x 5hr 3u = 50 x 3 = 150km Time = 150 ÷ 75 = 2 hours = (5 − 2) hours = 3 hours	33.	$\dfrac{1}{2}$ x 10 x 10 = 50cm²

34.	35. $20 \times 20 \times 10 = 4000cm^3$ $1\ min = 140cm^3 - 40cm^3$ $= 100cm^3$ $= 4000 \div 100$ $= 40\ minutes.\ (Ans)$
36. $17 - 10 = 7$ $14 - 10 = 4$ $7 + 4 + 10 = 21$ $45 - 21 = 24\ (Ans)$	37a. $\angle CBA = 180° - 128° = 52°$ $\angle DCB = 180° - 52° = 128°$ $= 128° \div 2 = 64°$ 37b. $180° - 64° = 116°\ (Ans)$
38a. $134°$ 38b.	39. $1800 - 200 = 1600$ $1600 \div 2 = 800\ (boys)$ $= 800 + 200$ $= 1000\ (girls)$ $800 = 100\%$ $200 = 25\%\ (Ans)$
40a. 3 40b.	41. $ABCD = 144cm^2$ 12×12 $= 144cm^2 - 48cm^2$ $= 96cm^2$ $48cm^2 = 12 \times 4$ $= 12 - 4 = 8$ $28cm^2 = 7 \times 4$ $8 \times 7 = 56cm^2\ (Ans)$

42.	**Martin**	**Martin + Jeremy**

42.

Martin
$5h = 1j$
$1h = \frac{1}{5}j$

Martin + Jeremy
$3h = 1j$
$1h = \frac{1}{3}j$

$\frac{1}{3} - \frac{1}{5} = \frac{2}{15}$

$\frac{2}{15} = 1$ hour

$\frac{1}{15} = \frac{1}{2}$ hour

$\frac{15}{15} = 7\frac{1}{2}$ (Ans)

43.

Distance $= 20km \times 3hr$
$\qquad = 60km$

Every 1hr = Joshua'2 20km faster than Hubert.

In 3 hrs = Joshua is 60km faster than Hubert.

1 hr = 60km
5 hrs = 300km
$\qquad = 300km + 20km$
$\qquad = 320km$ (Ans)

44.

A : B : C

1 : 5
3 : 15 : 25
25 − 12 = 13
12 : 13

45.

Area of semi-circle $= \left(\frac{22}{7} \times 21 \times 21\right) \div 2$
$\qquad = 33 \times 21$
$\qquad = 693cm^2$

$42 \div 3 = 14cm$

$= \left(\frac{22}{7} \times 21 \times 21\right) \times \frac{7}{2}$
$= 77 \times 7$
$= 539cm^2$

$3u = (693 − 539)cm^2$
$\quad = 154$
$1u = 154 \div 3$
$\quad = 51\frac{1}{3} cm^2$

46.

$\frac{5}{5} - \frac{2}{5} = \frac{3}{5}$ (total of utensil Mary's bought)

$2 − 1 = 1$ $\qquad$ $3 − 2 = 1$
$1u = 30$ $\qquad$ $5u = 150$
$5u = 30 \times 5$ $\qquad$ $2u = 30 \times 2$
$\quad = 150$ $\qquad\qquad = 60$

47.

Girls = 100 + (2 × 150) = 400
Boys = 250 + (1 × 150) = 400

$7u = 350$
$2u = 100$
$5u = 50 \times 5 = 250$

48a.	25 (No. of Δ 15 (No. of shaded Δ)
48b.	15 x 15 = 225 (Ans)
48c.	30 ÷ 2 = 15 = 15 x 31 = 465 (Ans)