

45. Dots and triangles are used to form figures that follow a pattern. The first three figures are shown below.

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Figure 1

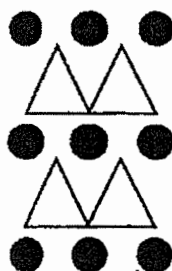


Figure 2

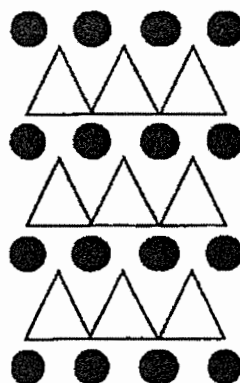


Figure 3

The table shows the number of dots and triangles used for each figure.

Figure Number	Number of dots	Number of triangles
1	4	1
2	9	4
3	16	9
4		

[2]

- (a) Fill in the table for Figure 4.
(b) Which Figure Number has a total of 100 dots?

Ans: (b) _____ [2]

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45. a)

25, 16

b)

Let n = figure number

Number of dots = $(n+1) \times (n+1)$

$$(n+1) \times (n+1) = 100 = 10 \times 10$$

$$n + 1 = 10$$

$$n = 9$$

Ans: a) 25, 16

b) 9

44. Three children shared some money. Alice and Benny received \$100 altogether. Benny and Catherine received \$450 in all. Catherine received five times as much money as Alice. How much money did Alice receive?

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Ans: _____ [4]

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44.	Alice	Benny	Catherine
Received	-----\$100-----		
Received		-----\$450-----	
Received	A		5A

$$A + B = 100 \quad (1)$$

$$B + C = 450 \quad (2)$$

$$C = 5A \quad (3)$$

$$B + 5A = 450 \quad (4) \text{ substitute (3) into (2)}$$

$$4A = 450 - 100 \quad (4) - (1)$$

$$A = 350 \div 4 = \$87.50 = \text{amount Alice received}$$

Ans: \$87.50

41. Josephine and Lin had 188 muffins altogether. Josephine and Balakrisnan had 548 muffins altogether. Balakrisnan had 4 times as many muffins as Lin. How many muffins did Josephine have?

Ans: _____ [4]

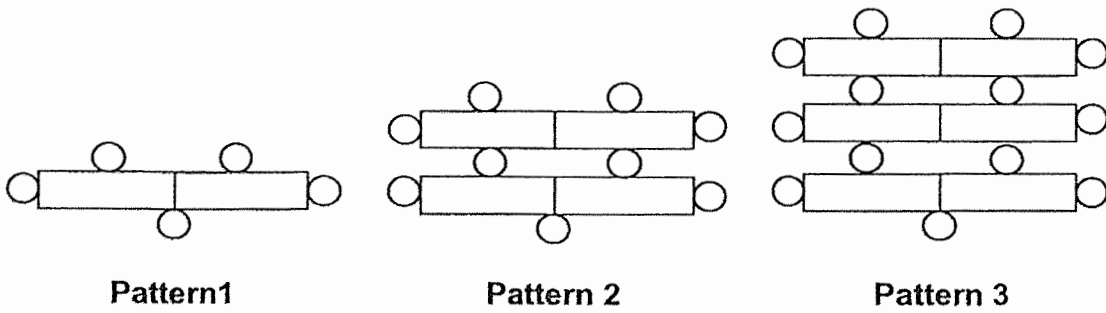
Ans: (a) _____ [2]

(b) _____ [2]

-
41. j = number of Josephine's muffin
 l = number of Lin's muffin
 b = number of Balakrisnan's muffin
 $j + l = 188$ (1)
 $j + b = 548$ (2)
 $b - l = 548 - 188 = 360$ (2) – (1) Difference
 $b = 4 \times l$
Difference between b and $l = 3l = 360$
 $l = 360 \div 3 = 120$
 $j + 120 = 188$ substitute l into (1)
 $j = 188 - 120 = 68$

Ans: 68

41. Study the patterns below.



Pattern	Rectangles	Circles	Total Shapes
1	2	5	7
2	4	9	13
3	6	13	19
⋮	⋮	⋮	⋮

- (a) What is the total number of rectangles in Pattern 8?
- (b) If the pattern has a total of 133 shapes, how many circles does it have?

Ans: (a) _____ [1]

(b) _____ [3]

41. a)

Let n = pattern number

Number of rectangles = $2n$

Number of rectangles in pattern 8 = $2 \times 8 = 16$

b)

Total number of shapes = $6(n-1) + 7 = 6n + 1 = 133$

$6n = 133 - 1 = 132$

$n = 132 \div 6 = 22$

Number of rectangles = $2n = 2 \times 22 = 44$

Number of circles = $133 - 44 = 89$

Ans: a) 16

b) 89

43. Vijay had a total of 20 red marbles, green marbles and yellow marbles. He had 4 more yellow marbles than green marbles. The 20 marbles weighed 138 g altogether. Each red marble weighed 2 g, each green marble weighed 5 g and each yellow marble weighed 10 g.

- (a) How many yellow marbles did Vijay have?
- (b) How much more did the green marbles weigh than the red marbles?

Ans: (a) _____ [2]

(b) _____ [2]

End of Paper

43*. a)

Excess mass of 4 yellow marbles = $4 \times 10 = 40\text{g}$

Mass other 16 marbles = $138 - 40 = 98\text{g}$

$2 \times R + 10 \times G + 5 \times G = 98 \text{ g}$

By trial & error, $G = 6$, $R = 4$

$2 \times 4 + 10 \times 6 + 5 \times 6 = 98 \text{ g}$

Number of yellow marbles = $4 + 6 = 10$

b)

Difference in mass between green & red marbles = $5 \times 6 - 2 \times 4 = 22$

Ans: a) 10

b) 22

41. Josephine and Lin had 188 muffins altogether. Josephine and Balakrisnan had 548 muffins altogether. Balakrisnan had 4 times as many muffins as Lin. How many muffins did Josephine have?

Ans: _____ [4]

41. (1)

Josephine	$u = \text{Lin}$
-----------	------------------

 = 188

(2)

Josephine	u	u	u	u
-----------	-----	-----	-----	-----

 = 548

(2) – (1)

$$4u - u = 3u = 548 - 188 = 360$$

$$u = 360 \div 3 = 120$$

$$\text{Number of muffins Josephine had} = 188 - 120 = 68$$

Ans: 68

Section C

For Questions 41 to 45, show your working clearly 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. All diagrams are not drawn to scale.

(20 marks)

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41. Larry had 35 more cookies than Kenny. Matthew had twice the total number of cookies that Larry and Kenny had. The 3 boys had 717 cookies altogether. How many cookies did Kenny have?

Ans: _____ [4]



Show your working clearly in the space provided for each question and write your answers in the spaces provided.

41. Larry

1u	35
----	----

Kenny

1u

Matthew

1u	35
1u	
1u	35
1u	

$$\text{Total} = 6u + 35 \times 3 = 717$$

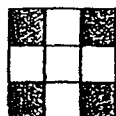
$$6u = 717 - 105 = 612$$

$$u = 612 \div 6 = 102 = \text{Number of cookies Kenny had}$$

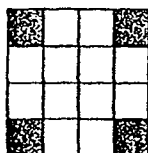
Ans: 102

45. The patterns below are made up of identical shaded and identical unshaded squares.

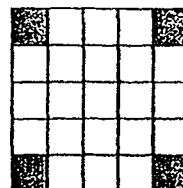
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Pattern 1



Pattern 2



Pattern 3

Pattern Number	Number of shaded squares	Number of unshaded squares	Total number of squares
1	4	5	9
2	4	12	16
3	4	21	25

- a) Find the total number of squares in Pattern 4.

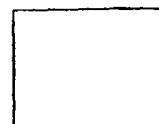
Ans: _____ [1]

- b) Find the number of unshaded squares in Pattern 4.

Ans: _____ [1]

- c) Which Pattern Number has a total of 100 squares?

Ans: _____ [2]



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45. a)

Let pattern number = n

Total number of squares = $(n + 2) \times (n + 2)$

For pattern number 4

Total number of squares = $(4 + 2) \times (4 + 2) = 36$

b)

Number of unshaded squares = Total squares – 4 = $36 - 4 = 32$

c)

$(n + 2) \times (n + 2) = 100$

$(n + 2) = \sqrt{100} = 10$

$n = 10 - 2 = 8$

Ans: a) 36

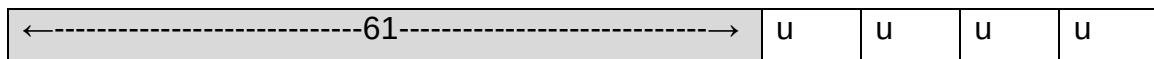
b) 32

c) Pattern 8

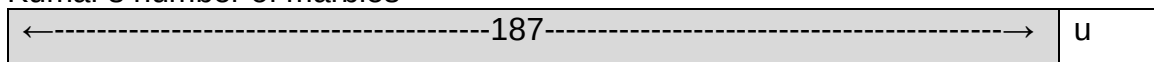
44. Dave and Kumar had an equal number of marbles at first. Both of them gave away some marbles. Dave gave away 4 times as many marbles as Kumar. In the end, Dave had 61 marbles while Kumar had 187 marbles. How many marbles did Dave have at first?

Ans: _____ [4]

44*. Dave's number of marbles



Kumar's number of marbles



$$\text{Difference in the end} = 187 - 61 = 126 = 4u - u = 3u$$

$$3u = 126$$

$$u = 126 \div 3 = 42$$

$$\text{Number of marbles Dave had at first} = 61 + 4u = 61 + 4 \times 42 = 229$$

Ans: 229