

Questions from Xue En (8 Feb)

1. Jill had a book. She found that 723 digits were used to number the pages of the book. How many pages were there in the book?

Suggested Solution:

<u>Pages</u>		<u>Digits</u>
1 to 9:	9 pages x 1 digit	= 9
10 to 99:	90 pages x 2 digits = 180	489
100 to 199:	100 pages x 3 digits	= 300

200 to pages x 3 digits = 234

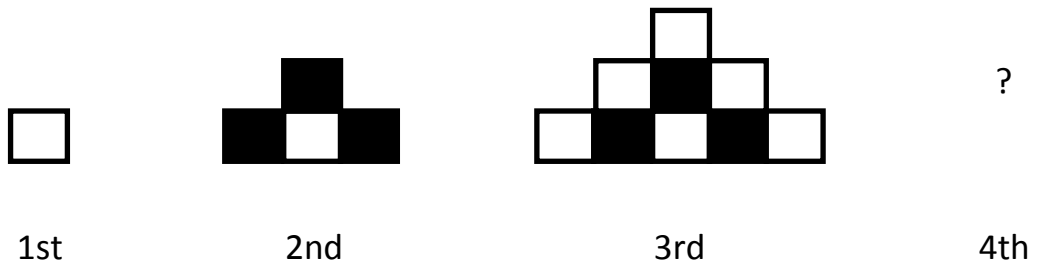
$234 \div 3 = 78$

$200 + 78 - 1 = 277$

723

Ans: **277 pages**

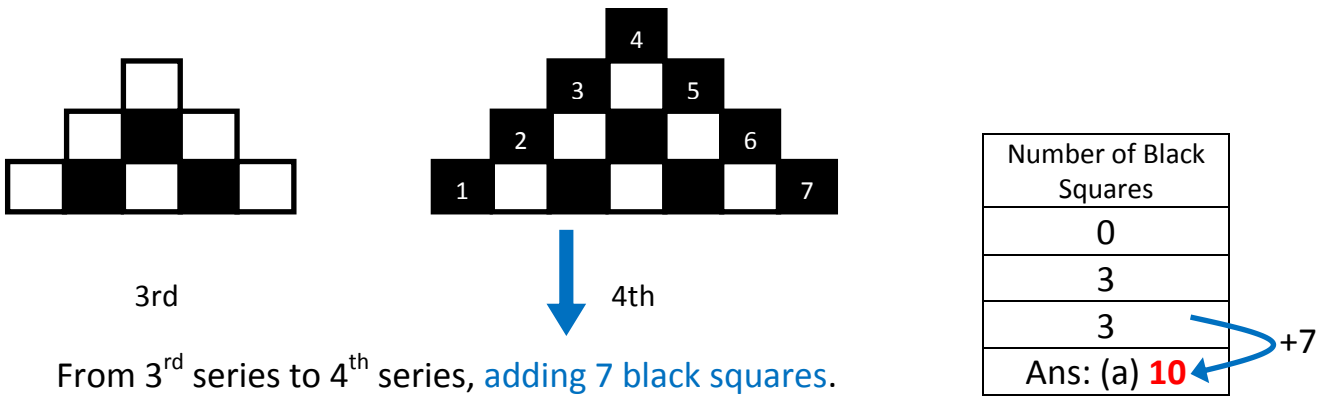
2. Study the series of patterns below and answer the questions that follow.



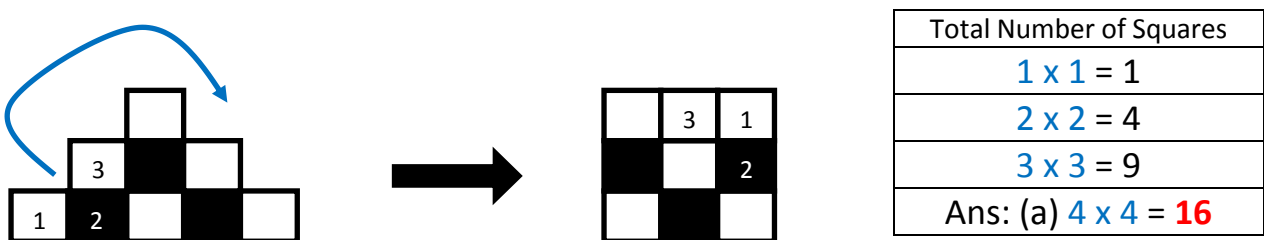
The series of patterns are tabulated as shown below.

(a) Complete the table by filling in the missing numbers in the 4th series.

Series Number	Number of White Squares	Number of Black Squares	Total Number of Squares
1 st	1	0	1
2 nd	1	3	4
3 rd	6	3	9
4 th	6		



The small squares in each series can be rearranged into square patterns. For example, the 3rd series...



so the total number of squares is always a square number. $\rightarrow 3 \times 3 = 9$

(b) Which series has a total of 169 squares?

$$\sqrt{169} = 13 \quad \text{or} \quad 13 \times 13 = 169$$

Ans: (b) **Series 13**

3. A red pole is $\frac{3}{5}$ m long. A blue pole is $\frac{1}{6}$ as long as the red pole. A yellow pole is $\frac{1}{20}$ m longer than the blue pole. Find the **total length** of the three poles.
(Give your answer in the simplest form.)


Suggested Solution:

$$1 \text{ m} \rightarrow 100 \text{ cm}$$

$$\frac{3}{5} \text{ m} \rightarrow \frac{3}{5} \times 100 \text{ cm} = 60 \text{ cm (red pole)}$$

$$\text{Blue pole is } \frac{1}{6} \text{ as long as red pole} \rightarrow \frac{1}{6} \times 60 \text{ cm} = 10 \text{ cm (blue pole)}$$

$$\frac{1}{20} \text{ m} \rightarrow \frac{1}{20} \times 100 \text{ cm} = 5 \text{ cm, } \frac{1}{20} \text{ m longer than blue pole}$$



$$\text{yellow pole} \rightarrow 10 \text{ cm} + 5 \text{ cm} = 15 \text{ cm}$$

Total length of the 3 poles
 \rightarrow red + blue + yellow
 $= 60 + 10 + 15 \text{ cm}$
 $= 85 \text{ cm}$

$$1 \text{ cm} \rightarrow \frac{1}{100} \text{ m}$$

$$85 \text{ cm} \rightarrow \frac{85}{100} = \frac{17}{20} \text{ m}$$

Ans: $\frac{17}{20} \text{ m}$

4. Ryan had 21 packets of green and red marbles altogether. There were 56 marbles in each packet. The ratio of the number of **green** marbles to the number of **red** marbles was **2 : 5**. He repacked all the green and red marbles **separately** into **packets of 15**.

(a) How many red marbles were there?

(b) How many green marbles were **left over** after repacking?

Suggested Solution:

Total number of marbles $\rightarrow 56 \times 21 = 1176$

<u>Green</u>	:	<u>Red</u>
2	:	5

$2 + 5 = 7$ units (total)

7 units $\rightarrow 1176$

1 unit $\rightarrow 168$

5 units $\rightarrow 840$

Ans: (a) **840 red marbles**

2 units $\rightarrow 168 \times 2 = 336$ (green marbles)

Number of packets $\rightarrow 336 \div 15 = 22 \text{ R } 6$

Ans: (b) **6 green marbles left over**