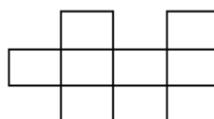


## 2018 SMC SAMPLE QUESTIONS for Primary

16 questions over 1 hour

### Questions 1 – 8 3 marks each (1,1,1)

1. What is the value of
  - i)  $\frac{2}{5} + \frac{2}{7}$  ?
  - ii)  $\frac{2}{5} \times \frac{2}{7}$  ?
  - iii)  $\frac{2}{5} \div \frac{2}{7}$  ?
  
2. 5 and 7 are called twin primes as they are consecutive odd prime numbers
  - i) What are the next pair of twin primes?
  - ii) There is a pair of twin primes between 40 and 50. What are they?
  - iii) The product of 3 prime numbers is 105. What is the largest of these 3 prime numbers?
  
3.
  - i) What is the smallest prime factor of 301?
  - ii) What is the largest prime factor of 301?
  - iii) What is the largest number less than 1000 which has a factor of 7?
  
4. A bag contains marbles of the same size 7 are red, 5 are blue, 6 are green and 11 are white. Marbles are taken from the bag, one at a time and not replaced. How many marbles must be taken from the bag to be sure that you have
  - i) two red marbles?
  - ii) two marbles of the same colour?
  - iii) at least one marble of each colour?
  
5. The figures drawn shows a grid of nine 1x1 squares  
How many
  - i) 4x1 rectangles can you find?
  - ii) 3x1 rectangles can you find?
  - iii) 2x1 rectangles can you find?



- 6A. You are given 4 rectangular boxes whose dimensions are as follows  
Box A 3x4x6 Box B 2x7x4 Box C 2x3x11 Box D 3x5x5  
Which box has the
  - i) largest volume?
  - ii) largest surface area?
  - iii) largest "perimeter", ie. total length of edges?

- 6B. Rebecca wrote down the following list of 2-digit numbers where the ten's digit is always larger than the unit's digit:  
 98, 97, 96, 95, 94, 93, 92, 91, 90, 87, 86, 85, 84, 83, 82, 81, 80, ...
- What was the next number that Rebecca wrote down?
  - How many numbers did she Rebecca have on her list that had the digit 4 in them?
  - What was the last number Rebecca had on her list?
7.
  - Through what angle does the hour hand of the clock turn in 22 minutes?
  - What is the smallest angle between the minute hand and the hour hand of the clock at 2:29 pm
  - Sally left home at 7:15 am and arrived home at 6:47 on the same day. How many hours and minutes was she away from home?
8. A25 and 76B are two 3-digit numbers where A and B are digits.  
 What are the values of A and B if
- the sum of A25 and 76B is as small as possible?
  - the difference between A25 and 76B is as large as possible?
  - the sum of A25 and 76B is 1194?

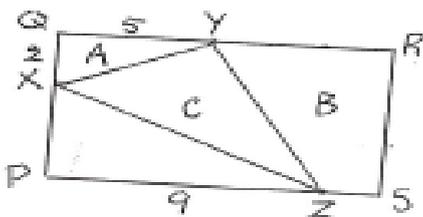
**Questions 9 – 12 4 marks each (1,1,2)**

9. In a 20 km cycling race Bennie rode the first 10 km at an average speed of 50 kph, the next 5km at an average speed of 60 kph and the last 5 km took her 8 minutes.
- How long (in minutes) did it take Bennie to ride the first 10 km?
  - What was Bennie's average speed over the last 5 km?
  - How long did it take Bennie to cycle the whole 20 km?

**10. NB You will need some grid/quadrule paper for this question.**

A straight line is drawn across a rectangular grid from the point A with coordinates (0,0) to the point B (x,y) where x and y are **whole numbers**. Points with this property are called **grid points**.

- If B is the point (8,4) how many grid points does the line AB contain?
  - If B is the point (5, 11) how many squares does the line AB pass through?
  - If B is the point (33, 69) how many grid points does the line AB contain?
11. The figure shows a 6 x 11 rectangle PQRS cut into 3 regions A, B and C by two straight lines XY and YZ, where X is on side PQ, Y is on side QR and Z is on side SP as shown.  
 Given that QX= 2, QY = 5 and PZ = 9 and Triangle QXY = A, XYZP = B and YRSZ= C
- What is the area of the region marked A?
  - What is the area of the region marked C?
  - What fraction of the rectangle is the region marked B?



12. Vikki wrote down the following repeated number pattern  
 3, 7, 8, 1, 3, 7, 8, 1, 3, 7, 8, 1, 3, 7, 8, 1, 3, ...
- What was the 2018<sup>th</sup> digit Vikki wrote down?
  - What is the sum of all 2018 digits Vikki wrote down?
  - At some point while writing down these numbers the sum of the numbers was 303.  
 At this point how many digits had she written down?
- 

**Questions 13 – 16 5 marks each (1,2,2)**

13. Susie made a 3x4x5 rectangular prism by using 60 1x1x1 unpainted cubes  
 She then painted the prism on the outside with white paint  
 How many of the cubes then had paint on:
- 3 and only 3 of its faces?
  - 2 and only 2 of its faces?
  - none of its faces?
- Note : students should draw their own rectangular prism
14.
  - What is 7% of \$120?
  - The Bad Guys gave a discount of 8% on a new i-phone. Megan ended up paying \$230 for her i-phone. What was the original marked price of her i-phone?
  - Tina bought a new car from ABC motors for \$12,600. She agrees to pay for the car with monthly instalments of \$900.  
 How long will it take for Tina to own her car?
15. A box holds a number of marbles numbered exactly from 10 to 99.
- How many marbles are in the box?
  - How many of the marbles have the sum of their digits equal to 7?
  - The marbles with equal sums of their digits are all the same colour and marbles with different sums of their digits have different colours.  
 How many different colours of marbles are there?
16. Consider the number triangle below:
- | Row number | Number pattern             |
|------------|----------------------------|
| 1          | 1                          |
| 2          | 2 3 4                      |
| 3          | 5 6 7 8 9                  |
| 4          | 10 11 12 13 14 15 16       |
| 5          | 17 18 19 20 21 22 23 24 25 |
- What is the first number in row 31?
  - What is the sum of the numbers in row 31?
  - In what row is the number 2018?
- 

**2018 SMC SAMPLE ANSWERS for Primary**

1. i)  $\frac{24}{35}$     ii)  $\frac{4}{35}$     iii)  $\frac{2}{5} \times \frac{7}{2} = \frac{7}{5}$
2. twin primes are pairs of primes which differ by 2 eg. (3,5) (5,7) (11,13) (17,19).  
 i) (11, 13)    ii) 41, 43    iii)  $3 \times 5 \times 7 = 105$

3. i) try 2,3,5,7 bingo 7 ii)  $301 = 7 \times 43$  factors of 301 are 1, 7, 43, 301  
iii) 994

4. i)  $(1 + 5 + 6 + 11) + 1 = 24$  ii)  $(1 + 1 + 1 + 1) + 1 = 5$  iii)  $(7 + 11 + 6) + 1 = 25$   
A good discussion – while you can get the requirements with less the words needed to be considered is “to be SURE”

5. i) 1 ii) 4 iii) 10

6A. Box	Volume	Surface area	“Perimeter”
A	72	88	52
B	56	100	52
C	66	122	48
D	75	110	52

6B. i) 76 ii) 9 iii) 10

7. i)  $22 \times \frac{1}{2} = 11^\circ$  ii)  $174 - 61 = 113 \text{ deg}$  iii)  $45\text{m} + 6 \text{ h} + 47 \text{ m} = 7\text{h } 32\text{m}$

8. i)  $125 + 760 = 885$  A=1 B=0 ii)  $925 - 760 = 165$   $769 - 125 = 644$   
iii) A = 4 B = 9

9. i)  $\frac{1}{5} \text{ h} = 12 \text{ m}$  ii)  $5 / (8/60) = 300/8 = 37.5 \text{ kph}$  iii)  $12 + 5 + 8 = 25 \text{ m}$

10. i) 5 ii) 15 iii) 4

11. i) 10 ii) 24 iii) 16/33

12. i) 7 ii)  $(504 \times 19) + 10 = 9586$   
iii) 63  $15 \times 19 = 285$  and need 18 more  $(15 \times 4) + 3 = 63$

13. i) 8 (corners) ii)  $4(1+2+3) = 24$  Consider the edges – not the corner ones  
iii)  $1 \times 2 \times 3 = 6$  - Take off the outer layer of cubes and have a  $1 \times 2 \times 3$  box inside

14. i) \$8.40 ii) \$230 is 92% of marked price thus  $230/92$  is 1% of MP and MP is  $230/92 \times 100 = \$250$   
iii)  $12600/900 = 14$  months

15. i) 90 ii) 7 iii) 18

For iii) the sum of the digits of the 90 numbers range from 1 (the number 10) to the largest digit sum of 18 (the number 99)

An interesting extension is to list the numbers with equal digit sums

Digit sum 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

How many? 1 2 3 4 5 6 7 8 9 9 8 7 6 5 4 3 2 1

16. i) Last number in row 30 is  $30^2 = 900$  so first number in row 31 is 901  
ii) Each row has odd number of numbers Middle number in row 31 is  $(901 + 961) / 2 = 931$  so sum of numbers in the row  $931 \times 61 = 56791$   
iii)  $44^2 = 1936$   $45^2 = 2025$  so number 2018 in row 45