

2022 HMC ROUND 1 – MEMORANDUM

1) One sixth of a number decreased by 4 is equal to 3. What is this number?

$$3 + 4 = 7$$

$$7 \times 6 = 42 \quad \text{B) } 42$$

2) Find the next number in the 4; 2; 1; $\frac{1}{2}$; $\frac{1}{4}$; ?,

$$\frac{1}{4} \div 2 = \frac{1}{8} \quad \text{E) } \frac{1}{8}$$



3) I am divisible by 5 and also by 6. I am less than 50 and greater than 10. Who am I?

Multiples of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45

Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48

Common one is 30. C) 30

4) What is the sum of the greatest 3-digit number with different digits and which is the smallest 4-digit number?

Greatest 3-digit number with different digits is 987

Smallest 4-digit number is 1000

The sum of both is 1987 D) 1987

5) If the day before yesterday is two days after Monday, then what day is it today?

Two days after Monday is Wednesday.

If day before yesterday is Wednesday, today is Friday. A) Friday



6) If 8 kilometers is 5 mile then how many kilometers in 35 miles?

$$5 \text{ miles} \times 7 = 35 \text{ miles}$$

$$8 \text{ km} \times 7 = 56 \text{ km} \quad \text{D) } 56$$

7) If you have R128 in the box and you remove half of the total for each day, how long will it take for there to be only 25 cents in the box?

Day1: R64

Day2: R32

Day3: R16

D) 9

Day4: R8

Day5: R4

Day6: R2

Day7: R1

Day8: 50cents

Day9: 25 cents

8) Two dice are thrown and the top face values are added. Which digit is most likely to be the unit digit of the sum?

$$1+1=2 \quad 2+1=3 \quad 3+1=4 \quad 4+1=5 \quad 5+1=6 \quad 6+1=7$$

$$1+2=3 \quad 2+2=4 \quad 3+2=5 \quad 4+2=6 \quad 5+2=7 \quad 6+2=8$$

$$1+3=4 \quad 2+3=5 \quad 3+3=6 \quad 4+3=7 \quad 5+3=8 \quad 6+3=9$$

$$1+4=5 \quad 2+4=6 \quad 3+4=7 \quad 4+4=8 \quad 5+4=9 \quad 6+4=10$$

$$1+5=6 \quad 2+5=7 \quad 3+5=8 \quad 4+5=9 \quad 5+5=10 \quad 6+5=11$$

$$1+6=7 \quad 2+6=8 \quad 3+6=9 \quad 4+6=10 \quad 5+6=11 \quad 6+6=12$$

E) 7



9) The areas of 3 faces of a rectangular box are 6 cm^2 , 8 cm^2 and 12 cm^2 . The volume of the box is

$$6 \text{ cm}^2 = 2 \text{ cm} \times 3 \text{ cm}$$

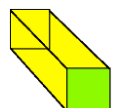
$$8 \text{ cm}^2 = 2 \text{ cm} \times 4 \text{ cm}$$

$$12 \text{ cm}^2 = 3 \text{ cm} \times 4 \text{ cm}$$

$$V = 2 \text{ cm} \times 3 \text{ cm} \times 4 \text{ cm} = 24 \text{ cm}^3 \quad \text{A) } 24 \text{ cm}^3$$

10) $1+3+5+7+\dots+25$ is subtracted from $2+4+6+8+\dots+26$. The answer is

$$(2 - 1) + (4 - 3) + \dots + (26 - 25) = 1 + 1 + \dots + 1 = 13 \quad \text{D) } 13$$

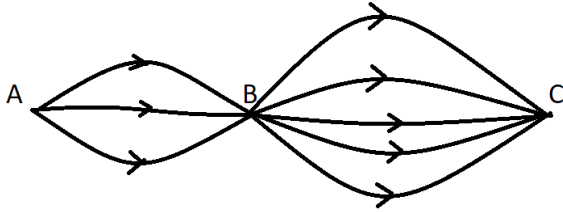


11) A shop owner has only a 1 kg, 2kg, 4kg, and 8 kg weight. Which of the following bags of flour cannot be weighted on this balance scale?



- A) 16 Nope
- B) 15 $1 + 2 + 4 + 8 = 15$
- C) 7 $1 + 2 + 4 = 7$
- D) 5 $1 + 4 = 5$
- E) 3 $1 + 4 = 3$

- 12) How many different routes are there from A to C passing through B moving along the routes in the direction of arrows?



There are 3 different ways from A to B.
 There are 5 different ways from B to C.
 So There will be $3 \times 5 = 15$ different ways from A to C.

E) 15

- 13) The letters in the word MATHEMATICIAN were put in a box. What is the chance of getting letter A?

There are 3 As.
 There are 13 letters.
 3 out of 13.

C) 3 out of 13

- 14) There is a bus with 3 girls. Each girl has 3 bags. There are 3 cats in each bag.

How many legs in total are there in the bus?
 Hint: Each cat has 4 legs and each girl has 2 legs

3 girls have 6 legs.
 Each bag has 3 cats, so 12 legs
 3 girls have 9 bags, therefore $9 \times 12 = 108$
 Total = $108 + 6 = 114$

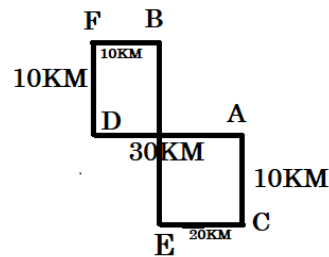
D) 114



- 15) A, B, C, D, E and F are towns situated as follows;

- * A is 30 km east of D
- * C is 20 km east of E
- * F is 10 km west of B
- * D is 10 km south of F
- * A is 10 km north of C

How far would you need to travel to get from B to E?
 D) 20km South



- 16) Harry and Terry are each told to calculate $8 - (2 + 5)$. Harry gets the correct answer. Terry ignores the brackets and calculates $8 - 2 + 5$. If Harry's answer is H and Terry's answer is T , what is the value of $H - T$?

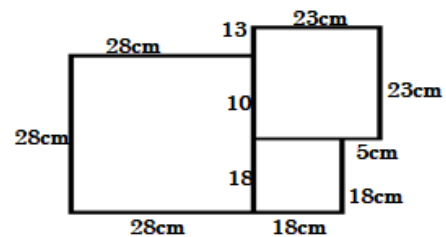
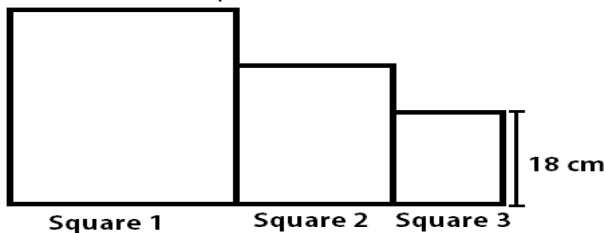
Harry: $8 - (2 + 5) = 8 - 7 = 1$ (H)
 Terry: $8 - 2 + 5 = 6 + 5 = 11$ (T)
 $H - T = 1 - 11 = -10$

A) - 10

- 17) What is half of 5, 4?

$5,4 \div 2 = 2,7$
 B) 2,7

- 18) There are three squares with their sides are 5cm less than other.



A shape is made by these three squares. What is the perimeter of new shape below:

$28 + 28 + 28 + 13 + 23 + 23 + 5 + 18 + 18 = 184$ B) 184 cm

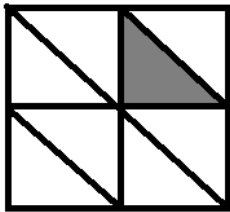
19) Find the ratio between number faces and number of edges in the below rectangular prism.



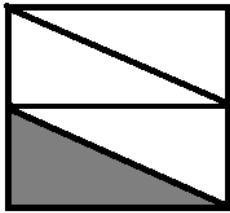
Number of faces: 6
Number of edges: 12
Ration $\frac{6}{12} = \frac{1}{2}$

C) $\frac{1}{2}$

20) What fraction of the square is shaded if the line inside divides the square into two equal parts?



→ 1 out of 8



→ 1 out of 4
It is equivalent to 2 out of 8

So ratio will be $\frac{1}{2}$

C) $\frac{3}{8}$

--- THE END ---