

**H**ORIZON

**M**ATHEMATICS

**C**OMPETITION

HMC 2010

BOOKLET - **A** SECOND ROUND  
INSTRUCTIONS

- Do not open this booklet until told to do so.
- This examination paper consists of 30 multiple choice questions of mathematics, logical deduction, and analytical reasoning. Each question is followed by answers marked a, b, c, d and e. Only one of these is correct.
- The final answers must be entered in the correct circle on the ANSWER SHEET which is supplied separately.
- Each correct answer is worth:
  - 4 marks in Part 1 (Questions from 1 to 15)
  - 6 marks in Part 2 (Questions from 16 to 30)
- There is a penalty, -1 mark, for the incorrect answers.
- Exam duration is 75 minutes and no extra time will be given.
- Calculators and geometry instruments are **NOT** permitted.
- Diagrams are **NOT** necessarily drawn to scale.
- Rough paper, pen, pencil, and rubber are permitted.
- Start when the invigilator tells you to do so. Good luck!



STAR COLLEGE

## PART I

1.  $1 + 2 - (-3) - 4 + 5 - 6 = ?$

- A) 0      B) 1      C) 3      D) 4      E) 5

2.  $\frac{3}{4} + \frac{5}{6} = ?$

- A)  $\frac{2}{3}$       B)  $\frac{6}{24}$       C)  $\frac{38}{12}$       D)  $\frac{19}{24}$       E)  $\frac{19}{12}$

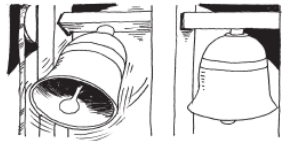
3. "Forty million two hundred and seven thousand" is

- A) 40207000      B) 4207000      C) 427000      D) 4020700      E) 42007000

4. How many 2- digit whole numbers are multiple of 6 and 8?

- A) 1      B) 2      C) 4      D) 6      E) 8

5. Two bells toll at intervals of 15 and 18 seconds respectively. If they start to ring at the same instant, how long will it take before they will again ring together?



- A) 50 sec      B) 72sec      C) 1 min      D) 90sec      E) 108sec

6.  $0.19 + 0.073 - 0.252 = ?$

- A) 1.1      B) 0.11      C) 0.011      D) 11      E) 0.001

7. A relay team of eleven people took 858 minutes to complete a relay race. If each member took exactly the same time, how long did each member take?



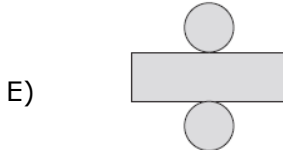
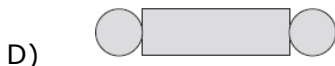
- A) 38      B) 48      C) 58      D) 68      E) 78

8. The following shows the income made by Radebe's Kiosk in one week.

Day of The Week	Income
Monday	R4750
Tuesday	R6500
Wednesday	R3250
Thursday	R3850
Friday	R9750

- A) There were no days with an income less than R3850
- B) Tuesday's income was R3700 more than Thursday's
- C) There was no day that had over R10000 in income
- D) The combined income of Monday and Thursday was not greater than R8500
- E) Average income of the Kiosk for five days is less than R5500

9. Which of the following nets could be used to make a cylinder?



10. In Star School, the ratio of students who bring lunch from home to those who buy it at tuck-shop is 11:3. If 87 buy their lunch, how many students are there at the school?

- A) 220
- B) 250
- C) 300
- D) 350
- E) 406

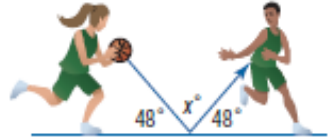
11. Nitesh has 24 notes. Half of the notes are R10, one third of the notes are R20 and the rest of the notes are R50. How much does Nitesh have?

- A) R520
- B) R480
- C) R400
- D) R360
- E) R240

**12.** Susan is 2 years older than Thabo, Nathan is twice as old as Thabo. If the sum of their ages is 34 years, how old is Susan?

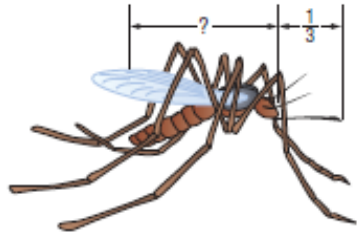
- A) 10      B) 12      C) 14      D) 16      E) 20

**13.** Anne makes a bounce pass to Ahmad. Find the value of  $x$  so Anne's pass hits Ahmad's hand.



- A) 104      B) 94      C) 84      D) 74      E) 64

**14.** A mosquito's proboscis, the part that sucks blood, is the first  $\frac{1}{3}$  of its body's length. The rest of the mosquito is made up of the head, thorax and abdomen. If the length of the proboscis of a mosquito is 1.65 millimeters, what is the length of the rest of the mosquito in meters?



- A) 3.3      B) 0.33      C) 0.033      D) 0.0033      E) 33

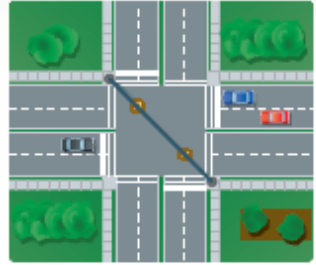
**15.** In a fish shop, four large fish weigh 4.65kg, 3.94kg, 3.07kg and 4.80kg. What must the minimum mass of a fifth fish be if the customer wants a minimum of 21 kg fish?



- A) 3.51      B) 3.52      C) 3.53      D) 4.54      E) 3.55

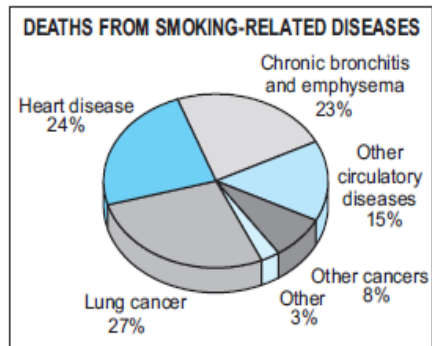
**PART II**

**16.** Traffic at the four-way intersection, the traffic lights change every 90 seconds. About 6 cars in one lane travel through each light change. Determine the approximate number of cars in all lanes that travel through the intersection in 6 minutes?



- A) 60      B) 96      C) 84      D) 72      E) 108

**17.** The graph alongside is the major smoking-related disease resulting in death. If 30 000 people died in one year as a result of smoking how many died from lung cancer



- A) 8100  
 B) 7200  
 C) 6900  
 D) 5500  
 E) 480

**18.** During 4 days of practice, a golfer hit 23 more balls each day than the previous day. How many golf balls did she hit in the 3<sup>rd</sup> day if she hit 532 balls in total?



- A) 96      B) 119      C) 144      D) 175      E) 201

**19.** If there are 25 people in a room and everyone must shake hands with everyone else, how many handshakes will there be in total?



- A) 200      B) 300      C) 250      D) 350      E) 400

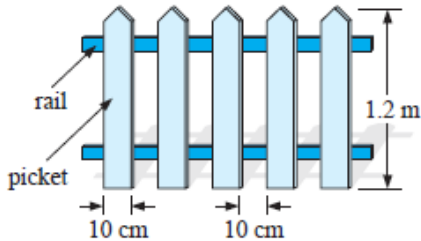
**20.** Solly leaves home at 13:00, bicycling at a rate of 24 km/h. Two hours later, Ammy leaves, driving at the rate of 48 km/h. At what time will Ammy catch up with Solly?

- A) 14:00    B) 15:00    C) 16:00    D) 17:00    E) 18:00

**21.** If  $a * b = a - b + 2a$  then what is the value of  $(3 * 4) * 5$

- A) 10    B) 9    C) 8    D) 7    E) 6

**22.** A small garden will be enclosed with a 20 meter picket fence as shown below. There are 1.5 meter posts in every 2 meters, which are attached to the rails. If the timber for the pickets costs R200 for every meter of the fence, the rails costs R750 per 5 meters and the posts costs R350 each; what is the total cost of this fence?



- A) R12000    B) R9500    C) R10500    D) R11000    E) R11500

**23.** The length of a rectangle is 1 cm more than twice its width. If the perimeter of the rectangle is 74 cm, what is the area of the rectangle?

- A) 200cm<sup>2</sup>    B) 250 cm<sup>2</sup>    C) 400 cm<sup>2</sup>    D) 350 cm<sup>2</sup>    E) 300 cm<sup>2</sup>

**24.** What is measure of the angle between the arms of the clock when the time 9:30?

- A) 105°  
 B) 90°  
 C) 75°  
 D) 120°  
 E) 150°



**25.**An electrician charges R450 an hour plus a callout fee of R600. A large job costs R8250. For how many hours did the electrician work?

- A) 10      B) 12      C) 14      D) 16      E) 17

**26.**If 3-digit number 3A5 is divisible by 9 what is the sum of the possible values of A?

- A) 12      B) 11      C) 10      D) 1      E) 9

**27.**Which one of the followings is the correct order of (addition, subtraction, or multiplication) signs between the following numbers, so that the equality would be true? (Do not use parentheses.)

$$8 \ 2 \ 4 \ 5 \ 2 = - 8$$

- A) + ; - ; x ; +  
 B) - ; x ; + ; -  
 C) x ; + ; - ; -  
 D) - ; + ; x ; -  
 E) + ; x ; + ; -



**28.**How many different letters are there in this sentence?

- A) 25      B) 21      C) 17      D) 16      E) 9

**29.**If  $k$  is an integer which of the following is always an even number?

- A)  $3k+1$     B)  $2k+2$     C)  $3k$       D)  $3k+4$     E)  $5k+2$

**30.**A group of boys share 150 bananas and 105 apples equally. What is the largest number of boys in this group?

- A) 18      B) 15      C) 12      D) 9      E) 6

A man is like a fraction  
whose numerator is what he is and whose denominator is  
what he thinks of himself.  
The larger the denominator the smaller the fraction.



Right decisions depend on having a sound mind and on sound thinking.  
What illuminates and develops mind is science and knowledge.  
For this reason, a mind deprived of science and knowledge  
cannot reach right decisions and is always exposed to deception  
and subject to being misled.



Teacher: What is further away, Australia or the Moon ?

Pupil: Australia, you can see the Moon at night!

Pupil: I wished we lived in the olden days.

Teacher: Why is that ?

Pupil: We wouldn't have so much history to learn!

Teacher: If you add  $34,312 + 76,188$ , divide the answer  
by 3 and times by 4, what do you get?

Pupil: The wrong answer!

Why did the teacher wear sunglasses? Because his class was so bright!

Teacher: Can anyone tell me how many seconds there are in a year?

Pupil: 12 - 2nd January, 2nd February...!

Why is six afraid of seven? Because seven ate nine.

Teacher: If I had seven oranges in one hand and eight oranges in the other,  
what would I have?

Pupil: Big hands!



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