HORIZON MATHEMATICS COMPETITION

HMC 2007 FIRST ROUND

NAME, SURNAME: ……

INSTRUCTIONS

- **Do not turn over this booklet until told to do so.**
- This examination paper consists of 20 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.
- The correct answers will be counted; there is no penalty for the incorrect answers.
- Exam duration is 60 minutes and no extra time will be given.
- Calculators or any other computing devices are NOT allowed.
- Rough paper, pen, pencil, and rubber are permitted.
- **Start when the invigilator tells you to do so.** Good luck!

1. The difference between 40% of 20 and 15% of 40 is

a) 3 b) 4 c) 5 d) 2 e) 1

2. 12,345 – 6,789

a) 5,656 b) 6,565 c) 5,566 d) 5,556 e) 6,556

3. If $a \otimes b = a \times b - 3$ then the value of $1 \otimes 2 + 3 \otimes 4$ is

a) 11 b) 7 c) 8 d) 12 e) 9

4. A pile of 40 sheets of paper is 0,8 cm thick. How thick is one sheet?

a) 0,2 mm b) 2 mm c) 0,002 cm d) 0,5 mm e) 5 mm

5. Two friends play a game in which they roll three dice and find the total of three numbers. Which one of the following totals can be expected to appear least frequently?

a) 4 b) 7 c) 10 d) 13 e) 16

6. $2 - 10 \div 4 + 6 \times 2 - 6 \div 4 + 2 = ?$

a) 2,5 b) 12 c) 15 d) 20 e) 9

7. The sum of nine consecutive odd integers is 297. What is the smallest number?

a) 23 b) 25 c) 27 d) 29 e) 31

8. Seven children play tennis. Each child plays each of the others once.
How many matches are played?

a) 15 b) 18 c) 20 d) 25 e) 21

9. If the pattern continued which of these numbers will appear?

3 ; 4 ; 8 ; 17 ; 33 ; ?

a) 69 b) 49 c) 65 d) 58 e) 66

10. $\frac{1}{2} + \frac{3}{4} - \frac{5}{6} = ?$

a) $\frac{5}{18}$ b) $\frac{1}{6}$ c) $\frac{7}{12}$ d) $\frac{9}{24}$ e) $\frac{5}{12}$

11. I have the following in my pocket: one 50c coin, one 20c coin, one 10c coin and one 2c coin. Which one of the following amounts can NOT I give someone without making a change?

a) 80c b) 32c c) 42c d) 52c e) 62c

12. This morning at 4:00, my watch was 9 minutes slow, but at 22:00 it was 15 minutes fast! At what time was it exactly correct?

a) 11:45 b) 11:15 c) 10:30 d) 11:30 e) 10:45

13. $2^3 = 2\times 2\times 2$ $5^5 = 5\times 5\times 5\times 5\times 5$ $1600 = 2^m \times 5^n$ What is the value of mxn=?

a) 6 b) 12 c) 15 d) 18 e) 16

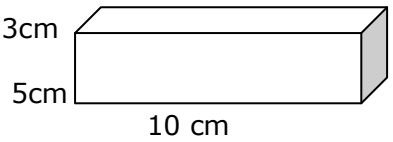
14. An ant covers a distance of 180 meters in 4 hours. The average speed of the ant in centimeters per minute is

a) 45 b) 75 c) 50 d) 60 e) 25

15. If n=8 then the value of $(n-5)(2n-9)(\frac{3n}{4}-1)$ is

a) 100 b) 75 c) 45 d) 140 e) 105

16. How much wrapping paper do you need to cover the rectangular prism gift box?

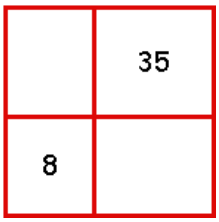


a) 140 b) 170 c) 166 d) 190 e) 180

17. $1{,}35\times 0{,}4 = ?$

a) 0,54 b) 1,08 c) 0,27 d) 5,4 e) 0,81

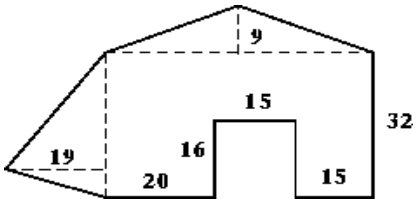
18. There is a square split into four parts. We have given the areasof the two parts; 8 and 35 unit squares. Area of the whole square in unit squares is



a) 86 b) 54 c) 81 d) 76 e) 64

19. Find the surface area of the figure shown:

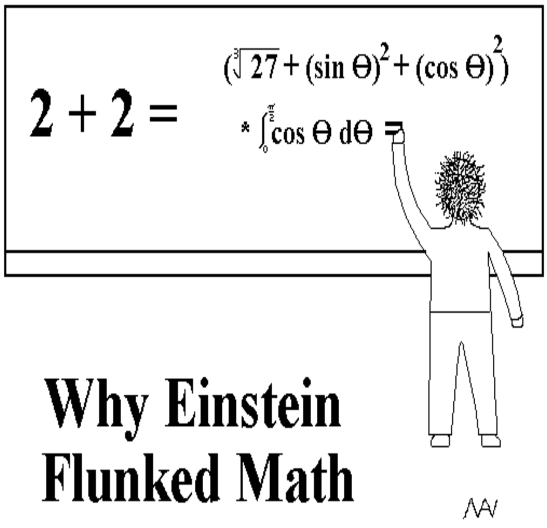
a) 1804
b) 1889
c) 2004
d) 2039
e) None of these



20. The smallest positive integer that is divisible by all the first ten positive integers is

a) 2520 b) 360 c) 2500 d) 1440 e) 1800

"I couldn't do my homework because my computer has a virus and so do all my pencils and pens."



I keep the subject constantly before me and wait till the first dawnings open little by little into the full light.

– Isaac Newton

%%%

The Universe is a grand book which cannot be read until one first learns to comprehend the language and become familiar with the characters in which it is composed. It is written in the language of mathematics.

– Galileo

%%%

The moving power of mathematics is not reasoning but imagination.

– Augustus De Morgan