Mathematica Centrum

Together, let's shape the mathematicians of the future

PYTHAGORAS PREPARATORY TEST 2013

1. The number of faces of a triangular pyramid is

A) 3 B) 4 C) 5 D) 6 E) 7

2. 3 x 2 x 3 x 2 = ?

A) 12 B) 36 C) 10 D) 25 E) 30

3. Which number is a multiple of 4?

A) 14 B) 13 C) 24 D) 74 E) 34

4. 11 x 3 = ? + 3

A) 11 B) 10 C) 30 D) 20 E) 36

5. The greatest common factor of 15 and 30 is also the least common multiple of

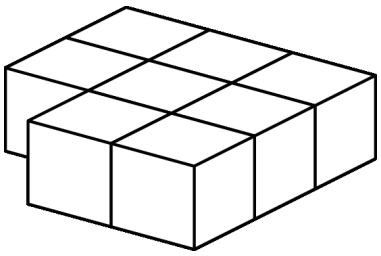
A) 3 and 5 B) 2 and 5 C) 4 and 5 D) 3 and 6 E) 5 and 6

6. The number of sides + the number of vertices + the number of lines of symmetry in a square is equal to

A) 9 B) 8 C) 11 D) 10 E) 12

7. The product of 50 x 10 x 2 is

A) 1 000 B) 100 C) 10 000
D) 2 000 E) 500



8. Eight blocks have been glued together as shown in the diagram. How many faces of these blocks have no glue on them?

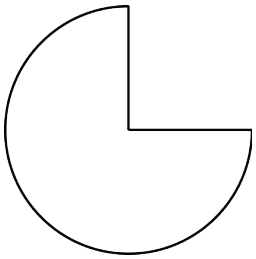
A) 32 B) 24 C) 30
D) 28 E) 26

9. Mathilda has bought 2¢ and 3¢ stamps for a total of 40¢. The number of 3¢ stamps that she has bought could be

A) 15 B) 7 C) 13 D) 12 E) 16

10. The result of 3 x 8 - 11 x 2 is

A) 4 B) 1 C) 3
D) 5 E) 2



11. What fraction of the pie has been eaten?

A) 1/4 B) 1/5 C) 1/6
D) 1/7 E) 1/8

12. How many of the following numbers: 1, 2, 3, 4, and 5 are common divisors of 10 and 12?

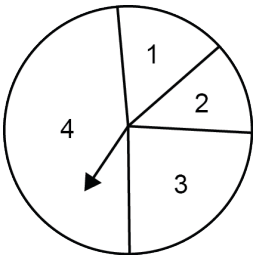
A) 1 B) 2 C) 3 D) 4 E) 5

13. The value of 10 mm + 10 cm + 10 dm is

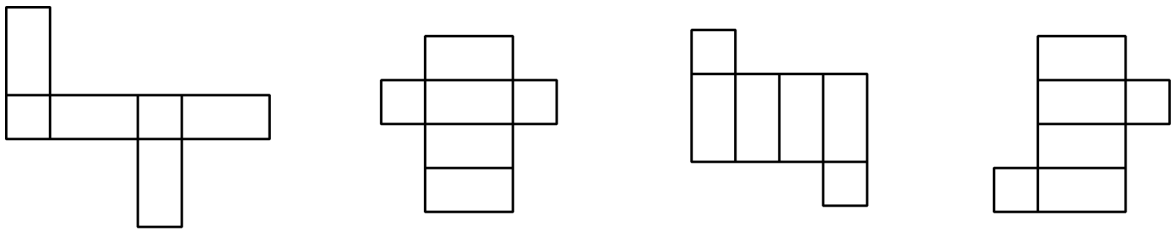
A) 30 cm B) 11 dm C) 110 mm D) 111 cm E) 1 m

14. Mathew has made a circular spinner. If he spins this spinner 1 000 times, which of the following best represents approximately the number of times he could expect to get a 3?

A) 100 times B) 500 times C) 650 times
D) 750 times E) 250 times



15. How many of the following 4 nets can form a rectangular prism?



I II III IV

A) 0 B) 1 C) 2 D) 3 E) 4

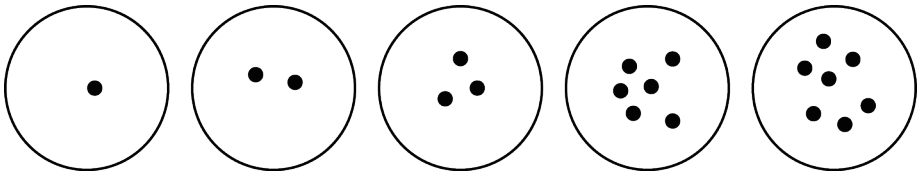
16. Each time that Melissa pours 45 ml of water in a beaker, Andrea pours 40 ml in it. The order in which they pour the water in the beaker is given by the sequence: A-M, M-A, A-M, M-A … (the first time, Andrea pours the water first, followed by Melissa, the second time, Melissa pours the water first, followed by Andrea and so on as determined by the sequence). How many times can Andrea pour the 40 ml of water completely in the 1 000 ml beaker without the water overflowing?

A) 9 times B) 13 times C) 11 times D) 10 times E) 12 times

17. When a natural number is divided by 6, the remainder is odd. This number could be

A) 12 B) 38 C) 53 D) 50 E) 14

18. How many dots must the next circle have to continue the sequence?

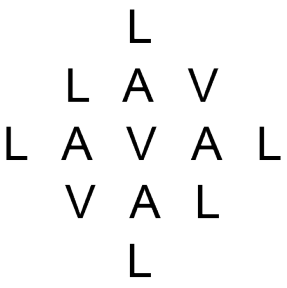


A) 13 B) 12 C) 11 D) 14 E) 15

19. Mathilda leaves from her house. She travels 1 km north, 3 km east, 2 km south, and finally 3 km west. At what distance from her house does she end her journey?

A) 3 km B) 1 km C) 2 km
D) 0 km E) 4 km

20. How many different ways can you read the word LAVAL, if you must read from left to right and from top to bottom?



A) 16 B) 17 C) 24
D) 19 E) 20

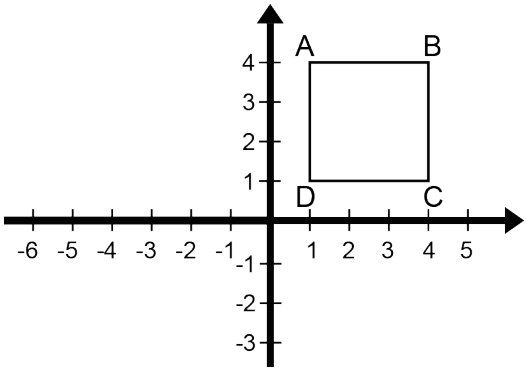
21. Mathew waxes a car 3 times faster than Andrea. If Andrea takes 36 minutes to wax the car, how much time will they take together to wax the same car?

A) 9 minutes B) 8 minutes C) 18 minutes D) 11 minutes E) 10 minutes

22. The ones digit of the following product: 13 x 12 x 11 x 10 x 9 x 8 x 7 is

A) 6 B) 5 C) 4
D) 3 E) 0

23. ABCD is a square. What are the coordinates of the image of vertex C, if the square is moved (translation) 5 units to the left, then 2 units down?



A) (0 , -1) B) (-2 , 0) C) (0 , -2)
D) (-1 , -1) E) (-1 , 0)

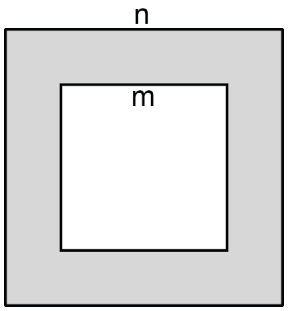
24. For a few years, on my birthday, my mother has deposited $3 000 in my bank account. Today is my birthday (I am 10 years old) and my mother has made another deposit of $3 000. After this deposit, I realise that I have a total of $9 000 in my account. What will the total be (in thousands of $) when I will be ‘’n’’ years old, if my mother continues to deposit $3 000 on each birthday?

A) (n - 10) + 9 B) 9 + (n - 10) x 3 C) (10 - n) x 3 D) (10 - n) x 3 + 9 E) 9 + 3 x n

25. Only one of the following is not a prime number. Which one is it?

A) 2 012 B) 13 C) 23 D) 43 E) 53

26. Letters m and n are natural numbers representing the lengths (in centimetres) of the sides of two squares. We know that m is an even number smaller than 10 and that the area of the shaded space between the 2 squares is 64 cm^2. What is the value of n?



A) 12 cm B) 6 cm C) 8 cm
D) 11 cm E) 10 cm

27. The number of sides of a quadrilateral, plus the number of sides of a pentagon, plus the number of sides of an hexagon is equal to

A) 12 B) 13 C) 14 D) 15 E) 16

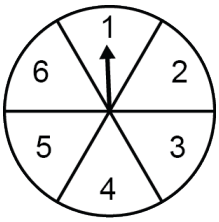
28. What is the value of m + n in the following equation: 15 x 14 = 21 x n x m, if n and m are prime numbers?

A) 6 B) 7 C) 8 D) 5 E) 9

29. A natural number is equal to 25 times its reciprocal. This number is

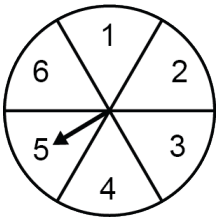
A) 3 B) 4 C) 5 D) 6 E) 7

30. Mathusalem has red and black cards. The number of red cards represents 3/5 of his black cards (he has 3 red cards for every 5 black cards). If he gets 6 more red cards, he will have just as many red cards as black cards. How many black cards does he have?



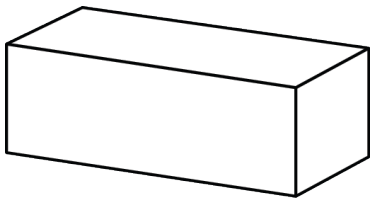
A) 18 B) 9 C) 12
D) 21 E) 15

31. Two spinners are used in an experiment. You spin the two spinners and write as a pair, the numbers obtained. If the result of the first spinner is a 2 and the result of the second is a 4, the outcome is represented by the pair (2,4). What is the probability that the outcome is a pair where the sum of the two numbers is 5 or less?



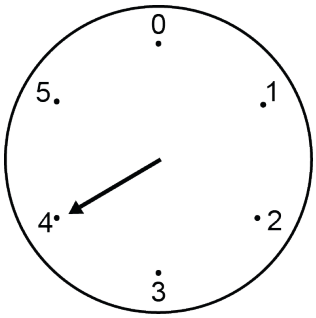
A) 1/9 B) 5/18 C) 1/6
D) 2/9 E) 7/36

32. The measures of a rectangular solid are 3 cm x 3 cm x 9 cm. What is the total area of this solid?



A) 136 cm^2 B) 122 cm^2 C) 126 cm^2
D) 116 cm^2 E) 124 cm^2

33. Using the clock in the diagram, we can write the following equations: 4 + 2 = 0, 5 + 3 = 2, 2 - 2 = 0, 1 - 3 = 4, 2 x 4 = 2, 5 x 3 = 3. What is the value of the following expression: 2 x 4 + 2 x 5?

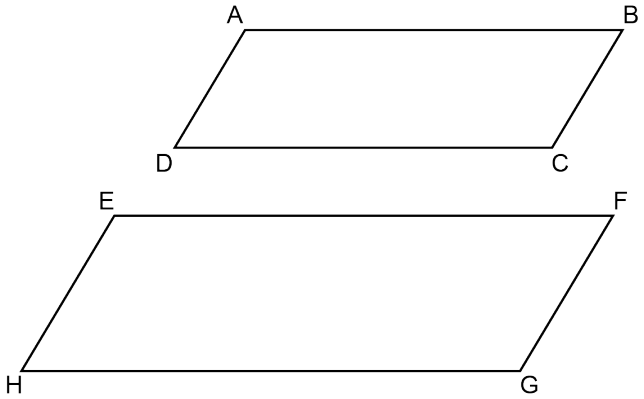


A) 0 B) 1
C) 2 D) 5
E) 4

34. What is the distance covered, in 1 minute, by a race horse that runs at an average speed of 36 km/h?

A) 1 400 m B) 960 m
C) 800 m D) 1 200 m
E) 600 m

35. The diagram on the right is made of 2 parallelograms. Line segment AB is parallel to line segment EF. How many pairs of parallel line segments can you count in this diagram?



A) 16 pairs B) 10 pairs
C) 8 pairs D) 12 pairs
E) 14 pairs