# Mathematica Centrum

Together, let's shape the mathematicians of the future

## PYTHAGORAS PREPARATORY TEST 2014

**1.** The number of vertices plus the number of edges of a cube is equal to

A) 22 B) 14 C) 20 D) 18 E) 16

**2.** Which number is a multiple of 4?

A) 18 B) 24 C) 34 D) 14 E) 23

**3.** Three quarters = 10 dimes - ? nickels.

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

**4.** (5 x 100) + (5 x 10) - (5 x 0.1) = ?

A) 550.5 B) 548.5 C) 54.5 D) 550 E) 549.5

**5.** The missing number in the equation: 10 x 2 ÷ 4 = ? ÷ 4 is

A) 5 B) 20 C) 10 D) 16 E) 24

**6.** The number of sides of a rectangle multiplied by the number of faces of a cube is equal to

A) 24 B) 18 C) 20 D) 16 E) 32

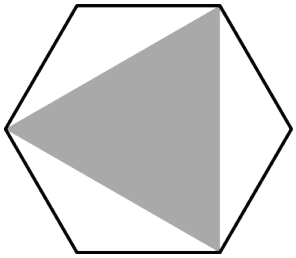
**7.** Round 9 999 to the nearest hundred. The answer is

A) 11 000 B) 9 100 C) 9 000 D) 9 099 E) 10 000

**8.** Three times a number minus 3 is equal to 21.
What is the number?

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

**9.** What fraction of the regular hexagon is shaded?



A) 1/4 B) 1/5 C) 1/6
D) 1/2 E) 1/3

**10.** What is the value of n in the equation: 2 x n = n + 3?

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

**11.** Mathew talked for 150 seconds. He talked for

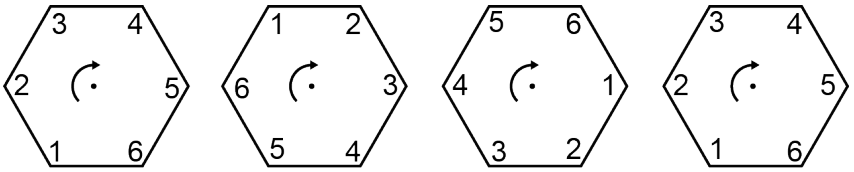
A) 1 ½ min B) 2 min C) 1 ¾ min
D) 2 ¼ min E) 2 ½ min

$$\frac{78A}{B} = 1C7$$

**12.** If A, B, and C represent 3 different digits, what is the sum of A + B + C that will yield a result that is exact?

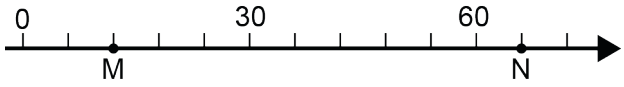
A) 19 B) 18 C) 20 D) 21 E) 17

**13.** The hexagons in the diagram form a sequence. The rotation around the centre (in the direction shown by the arrow) that can generate this sequence is a rotation of



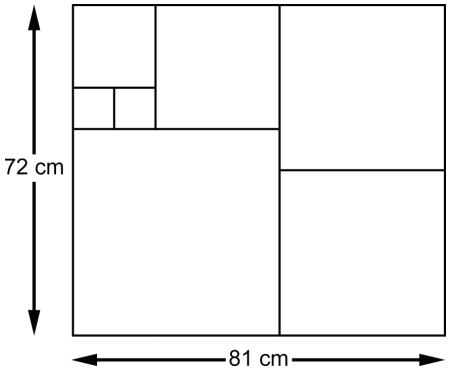

A) 3/6 of a turn B) 2/6 of a turn C) 4/6 of a turn D) 6/6 of a turn E) 5/6 of a turn

**14.** What is the length of segment MN (distance between points M and N on the number line )?



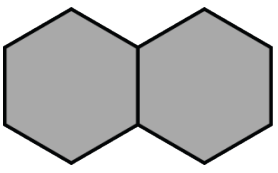

A) 45 B) 48 C) 54
D) 42 E) 60

**15.** Tim has used square tiles to cover a rectangular surface of 81 cm x 72 cm. What is the length of the side of the smallest tile he has used?




A) 9 cm B) 10 cm C) 11 cm
D) 7 cm E) 8 cm

**16.** How many hexagons must be drawn to completely surround the 2 shaded hexagons?



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

**17.** I am a prime number that is a factor of 10 and 25. Multiplied by myself, I give a product of

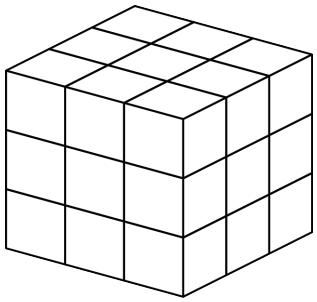
A) 64 B) 25 C) 16
D) 9 E) 4

**18.** The fourth day of a month is a Monday. The last day of this month cannot be a Wednesday, nor a Tuesday, nor a

A) Saturday B) Thursday C) Friday D) Sunday E) Monday

**19.** How many natural numbers between 10 and 60 have at least one digit which is a ‘’3’’?

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

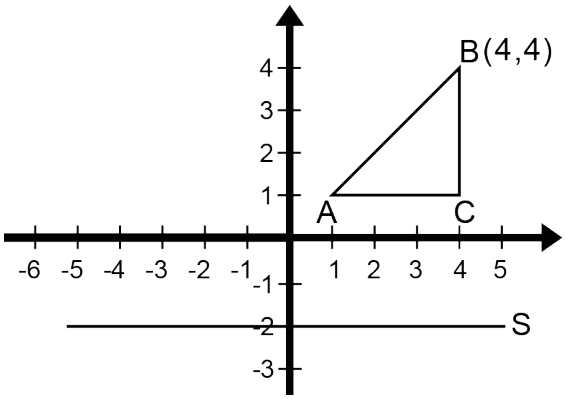


**20.** A large wooden cube is painted and then divided into 27 smaller cubes (see diagram). How many of these small cubes have only one face that is covered with paint?

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

**21.** There are some numbers between 0 and 100 that are multiples of 7 and that, when divided by 2 or by 3, leave a remainder of 1. Which of the following numbers could be one of them?

A) 14 B) 28 C) 77
D) 49 E) 84




**22.** The product of all the factors of 35 is equal to

A) 1 225 B) 1 245 C) 35
D) 245 E) 175

**23.** What are the coordinates of the flipped image of vertex A of right triangle ABC if S is a flip line?

A) (1 , -4) B) (1 , -8) C) (1 , -6) D) (1 , -5) E) (1 , -7)

**24.** Mathew had a score of 6 out of 10 on his first test and 10 out 10 on his second test. What was his average for the two tests?

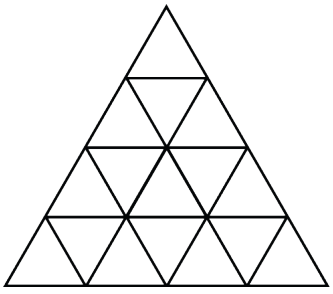
A) 80% B) 84% C) 82% D) 75% E) 90%

**25.** Mathusalem has a weird watch. At 5:56, his watch, which was running 4 minutes fast, showed a time of 6:00. His watch has gained an extra 2 minutes every hour since 5:56. What is the right time, if his watch now shows a time of 10:39?

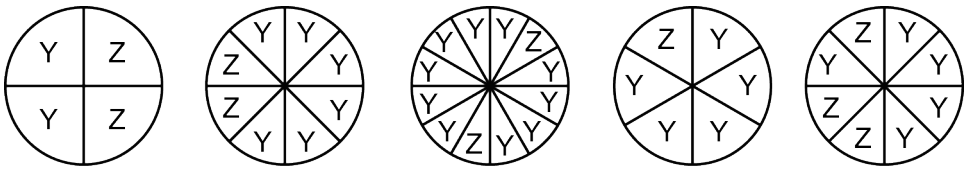
A) 10:24 B) 10:28 C) 10:27
D) 10:25 E) 10:26

**26.** How many different triangles can you count in the diagram opposite?

A) 26 B) 27 C) 28
D) 29 E) 30

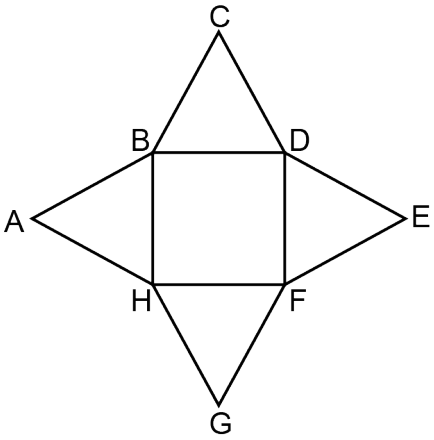


**27.** The probability of getting a Z is the same for two of the following 5 spinners. What is this probability?




A) 1/6 B) 1/3 C) 3/8
D) 1/2 E) 1/4

**28.** A square is surrounded by 4 equilateral triangles. The perimeter of the concave octagon ABCDEFGH is 64 cm. What is the area of the square?

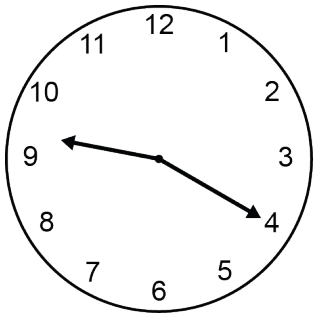



A) 81 $cm^2$ B) 25 $cm^2$
C) 49 $cm^2$ D) 32 $cm^2$
E) 64 $cm^2$

**29.** Which fraction is between 1/6 and 1/4?

A) 5/24 B) 3/12 C) 7/24
D) 2/5 E) 4/24

**30.** The measure of the angle formed by the minute and hour hands when it is 9:20 is equal to




A) 140º B) 150º C) 160º
D) 145º E) 155º

**31.** If 10% of a number is equal to 11, then 20% of half the same number is equal to

A) 22 B) 33 C) 44
D) 11 E) 27

**32.** Tim has always had trouble with arithmetic. Every time he multiplies two numbers, he makes the same mistake. For Tim, 3 x 10 = 45 and 3 x 8 = 36. For Tim, the product of 5 x 10 is equal to

A) 70 B) 90 C) 100 D) 80 E) 75

**33.** Which of the following is the product of 3 consecutive odd numbers?

A) 21 B) 90 C) 105 D) 280 E) 385

**34.** Mathilda has lived 10 million seconds more than Mathew. She has lived approximately

A) 100 days more B) 116 days more C) 1 year more D) 8 months more E) 10 months more