Part A

1. What is a third of a quarter of 32 ?

   (A) $\frac{5}{2}$ (B) $\frac{8}{3}$ (C) $\frac{16}{3}$ (D) 8   (E) 10

2. What is the value of $2^3 \times 3^2 \div 12 + \left(\frac{3}{4} \times 8\right)$?

   (A) 9   (B) 12   (C) 15   (D) 18   (E) 26

3. What is the perimeter, in cm, of a square with an area of 64 square centimeters ?

   (A) 16   (B) 24   (C) 32   (D) 48   (E) 64

4. In the Fibonacci sequence, the first two numbers are 1 and 1, and each number after those is the sum of the two previous numbers. Then, the sum of the squares of the fourth and the fifth Fibonacci numbers is equal to :

   (A) 5   (B) 10   (C) 13   (D) 25   (E) 34

5. Suppose that you start with the number 1000 and you add on to that amount following these instructions : add 40, add 1000, add 30 and then again add 1000, add 20, add 1000 again and finally add 10. What is the final result ?

   (A) 4100   (B) 4900   (C) 4990   (D) 5000   (E) none of these

6. You throw three 6-sided dice. If the result written (a, b, c) means that the first die shows "a", the second die shows "b", and the third die shows "c", then there are 3 ways of getting a sum of 4, namely, (1, 1, 2), (1, 2, 1) and (2, 1, 1). In how many ways can you get a sum of 7 ?

   (A) 10   (B) 15   (C) 21   (D) 24   (E) 27

7. In the following diagram, each small square has a side length of 1 cm. What is the area, in cm^2, of the shaded quadrilateral?

(A) 26   (B) 28   (C) 30   (D) 32   (E) 34

8. On May 1st, a store announces a super smartphone at \$1000. On May 4th, the price is reduced by 10%. On May 9th, the price is further reduced by 10%. Finally, on May 12th, the price is reduced by another 10%. What is the price of this super smartphone on May 12th?

(A) \$700   (B) \$729   (C) \$800   (D) \$810   (E) \$900

9. The circle centered at O has a radius equal to 5. The coordinates of O are $(0,0)$ and those of A are (x,y). If $\frac{x}{y} = 0.75$, what is the value of x?

(A) 1.5   (B) 2   (C) 2.5   (D) 3   (E) 4

10. Two pirates have their pockets full of gold. The first says to the second : "If I give you 10 pieces of gold, you will have as many pieces of gold as I have." The second says to the first : "If I give you 10 pieces of gold, you will have twice as many pieces of gold as I have." How many pieces of gold do they have together?

(A) 50   (B) 70   (C) 100   (D) 110   (E) 120

Part B

11. In a house there are three clocks. One clock chimes every 20 minutes. The second one chimes every 25 minutes and the last one chimes every 30 minutes. If at a given time all three clocks chime together for the first time, how many minutes later will the three clocks chime together for the sixth time?

    (A) 600   (B) 750   (C) 1200   (D) 1500   (E) 1800

12. A 12 cm by 4 cm by 3 cm rectangular box is shown below. What is the length, in centimeters, of the diagonal AB?
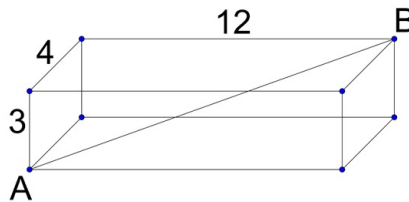
    (A) $\sqrt{153}$ (B) $\sqrt{160}$ (C) 13   (D) 17   (E) 19

13. If the value of $3 \times 3 \times 3 \times 3 \ldots \times 3$ (where the number 3 appears 2017 times in the product) was written out in full, what would be the final digit?

    (A) 1   (B) 3   (C) 5   (D) 7   (E) 9

14. A florist just received 210 red roses and 195 white roses. He wants to make large bouquets of roses, using all of the roses and combining red and white roses. He wants all bouquets to be identical. What is the largest number of bouquets that the florist can make?

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

15. In base 10, the value of 123 is $(1 \times 10 \times 10) + (2 \times 10) + (3 \times 1)$. If the number 123 was in base 7 it would be equal in base 10 to $(1 \times 7 \times 7) + (2 \times 7) + (3 \times 1) = 66$. If a number in base 7 is written 1111, what is the value of this number in base 10?

    (A) 343   (B) 375   (C) 400   (D) 449   (E) 500

16. You visited a Chinese garden. You had to cross seven doors. At each door you had to leave half of the money you had plus $1. If you are left with $1 at the end, how many dollars did you have at the beginning?

    (A) 127   (B) 190   (C) 255   (D) 382   (E) 766

17. During the last big storm, 30 cm of snow fell on Mathtown, a city that has a rectangular shape, 3 km wide and 30 km long. If all the snow that has fallen on Mathtown during this storm would fill a very large cube of snow, what would be the length of its side in meters?

    (A) 30   (B) 100   (C) 300   (D) 1000   (E) 3000

18. Some friends contribute equally to buy a game. If each friend contributes $3, they have $2 more than needed. If each friend contributes $2, they have $2 less than needed. How many friends are there?

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

19. At Joe's fruit store, two apples and three oranges cost $4.30 while four apples and one orange cost $4.10. What is the cost of one apple and four oranges?
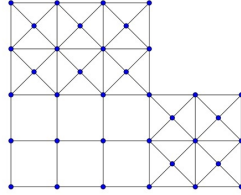
    (A) $4.10   (B) $4.20   (C) $4.30   (D) $4.40   (E) $4.50

20. The earth's radius is roughly 6375 km. The moon's radius is roughly 1735 km. Knowing that the volume of a sphere of radius r is equal to $\frac{4}{3}\pi r^3$, what would be, roughly, the result if the volume of the earth was divided by the volume of the moon?

    (A) 4   (B) 8   (C) 14   (D) 50   (E) 100

Part C

21. How many squares are there in the following diagram ?

(A) 25   (B) 30   (C) 35   (D) 40   (E) 45

22. John runs 25% faster than Ahcène. Ahcène runs 25% faster than Paul. Together they run a relay in which each one of them runs 1 km. If, together, they took 10 minutes to run these 3 km, what was the average speed of Ahcène in km/h ?
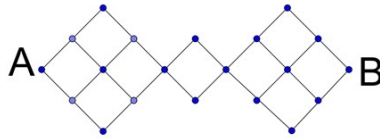
(A) 6.1   (B) 18   (C) 18.3   (D) 36   (E) 36.6

23. The small circle has a radius equal to 1 and is inscribed in a square. The square is inscribed in the large circle. What is the area of the shaded region ?
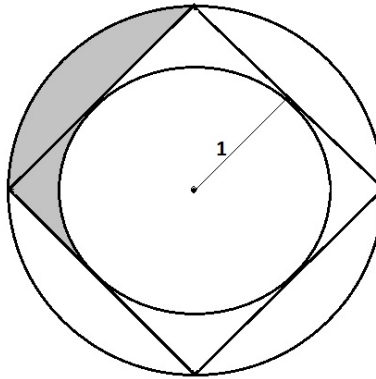
(A) $\frac{\pi}{4}$ (B) $\pi - 2$ (C) $2 - \frac{\pi}{4}$ (D) $\frac{\pi}{2}$ (E) $\pi - 1$

24. If you must always move to the right in the diagram below, horizontally or diagonally, how many different paths can you take from A to B?
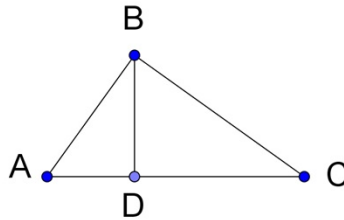

(A) 36   (B) 54   (C) 72   (D) 90   (E) 128

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25. How many integers between 1 and 1000 have exactly one 7 in their digits?

(A) 190   (B) 235   (C) 243   (D) 252   (E) 260

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26. Triangle ABC has a right angle at B.
    BD is perpendicular to AC. If AB measures 3 cm and BC measures 4 cm, what is the measure of BD in cm?

(A) 2   (B) $\frac{11}{5}$ (C) $\frac{12}{5}$ (D) $\frac{13}{5}$ (E) $\frac{14}{5}$