Part A

1. What is a third of a quarter of 48 ?

   (A) 3 (B) 4 (C) 6 (D) 8 (E) 12

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2. What is the value of $(8 \times 9 \div 6 + 39) \div 3$?

   (A) 12 (B) 16 (C) 17 (D) 18 (E) 25

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3. Which of the following numbers is divisible by 9 ?

   (A) 2734 (B) 3635 (C) 4536 (D) 5437 (E) 6338

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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 square of the sixth number is equal to:

   (A) 16 (B) 25 (C) 64 (D) 121 (E) 169

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5. A young boy says "I have the same number of brothers as I have sisters." His sister replies "I have twice as many brothers as sisters." How many children are in this family ?

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

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6. 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

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7. 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 6 ?

   (A) 3 (B) 6 (C) 8 (D) 10 (E) 12

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

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

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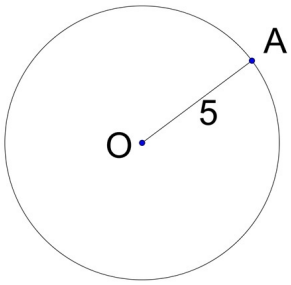
9. The circle centered at O has a radius equal to 5. The coordinates of O are $(0, 0)$ and those of A are (x, y). If $\frac{x}{y} = 0.75$, what is the value of x ?



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

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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. A radio signal sent from the Earth takes 1.25 seconds to reach the Moon which is at a 375,000 km distance from Earth. When the planet Mars is at its closest to the Earth, a radio signal from Mars reaches the Earth after 4 minutes and 10 seconds. What is the distance, in millions of kilometers, between Mars and the Earth when Mars is at its closest to the Earth ?

(A) 50 (B) 60 (C) 75 (D) 80 (E) 90

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12. In a house there are three clocks. One clock chimes every 20 minutes. Another one chimes every 25 minutes and the last one chimes every 30 minutes. If at a given time all the 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

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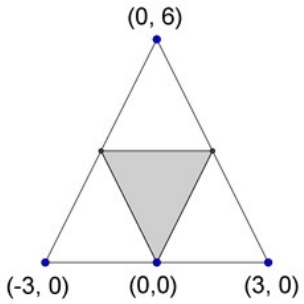
13. The vertices of the small shaded triangle are the centers of the sides of the large triangle. Coordinates of some points are shown, including all vertices of the larger triangle. If the unit of measure is the cm, what is the area, in cm^2, of the small shaded triangle ?



(A) 4 (B) 4.5 (C) 6 (D) 9 (E) 18

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14. A florist just received 200 red roses and 180 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) 5 (B) 10 (C) 18 (D) 20 (E) 40

15. In base 10, the value of 123 is $(1\times10\times10)+(2\times10)+(3\times1)$. If the number 123 was in base 7, it would be equal in base 10 to $(1\times7\times7)+(2\times7)+(3\times1)=66$. If a number in base 7 is written 235, what is the value of this number in base 10 ?

(A) 107 (B) 118 (C) 124 (D) 140 (E) 454

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16. You visited a Chinese garden. You had to cross six 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) 31 (B) 46 (C) 63 (D) 94 (E) 190

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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

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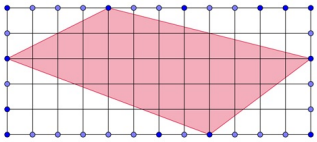
18. In the following diagram, each small square has a side length of 1 cm. What is the area, in cm^2, of the shaded quadrilateral ?



(A) 24 (B) 28 (C) 30 (D) 32 (E) 36

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19. 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

20. 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 ?

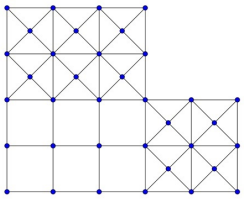
(A) \$4.10 (B) \$4.20 (C) \$4.30 (D) \$4.40 (E) \$4.50

Part C

21. 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 ?

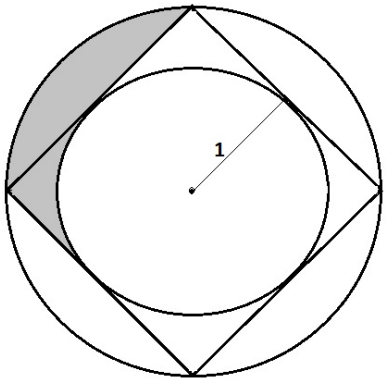
(A) 1 (B) 3 (C) 5 (D) 7 (E) 9

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



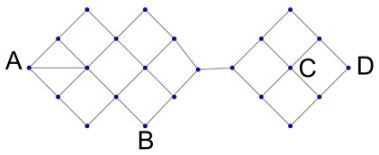
(A) 25 (B) 30 (C) 35 (D) 40 (E) 45

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. In the following diagram, how many paths are there between A and D if you should always go towards the right (horizontally or diagonally) and you must pass through both B and C ?



(A) 10 (B) 12 (C) 14 (D) 16 (E) 18

25. If the integers from 9 to 999 are listed, how many of the integers in the list do not have the digit 9 in them ?

(A) 622 (B) 720 (C) 721 (D) 802 (E) 900

26. In a restaurant, 63 customers are eating spaghetti, pizza or chicken wings. 28 of these customers are eating spaghetti, 22 are eating pizza and 34 are eating chicken wings and, among them, 9 are eating both spaghetti and pizza, 7 are eating both spaghetti and chicken wings and 8 are eating both pizza and chicken wings. How many are eating all three of spaghetti, pizza, and chicken wings ?

(A) 0 (B) 1 (C) 2 (D) 3 (E) 5