Part A

1. Which number is the largest ?

   (A) $4 \times 4 \times 4$ (B) 7×10 (C) $85 - 17$ (D) 23×3 (E) $45 + 26$

2. What is the value of $[(+9) + (-4)] - (+7) + (+25) - [(+8) - (-5)]$?

   (A) 10   (B) 13   (C) 18   (D) 22   (E) 24

3. What is the value of : $\dfrac{2}{3} + \dfrac{1}{4}$?

   (A) $\dfrac{5}{6}$ (B) $\dfrac{11}{12}$ (C) 1   (D) $\dfrac{13}{12}$ (E) $\dfrac{7}{6}$

4. My parents won $1,200 in the lottery. They decide to share this amount as follows
   — one third will go to the bank to pay the mortgage.
   — one quarter will be spent buying toys.
   — two sixths will be used to repair the family car.
   What will remain of the amount won ?

   (A) $50   (B) $100   (C) $150   (D) $200   (E) $250

5. The base of an aquarium measures 80 cm by 60 cm. If you pour 48,000 cm^3 of water into the aquarium, what will be the depth of the water ?

   (A) 4 cm   (B) 5 cm   (C) 6 cm   (D) 10 cm   (E) 14 cm

6. A salesman receives a 10% commission on the first $1,000 of sales, and 15% for all sales above $1,000. If last week's sales totalled $ 5,000 then what was the salesman's total commission ?

   (A) $500   (B) $600   (C) $700   (D) $800   (E) $900

7. Jules and Ginette each have a bag of marbles. Jules's bag contains twice as many as Ginette's bag. If six marbles were removed from each bag, Jules's bag would then contain three times as many as Ginette's. How many marbles does Jules's bag contain at the start ?

   (A) 12   (B) 18   (C) 24   (D) 30   (E) 36

8. A lumberjack usually starts his days slowly. Today he cut 8 trees in his first hour of work. Every hour thereafter, he cut one more tree than during the previous hour. How many trees did this lumberjack cut today if he worked eight hours in all?

   (A) 77   (B) 88   (C) 90   (D) 92   (E) 108

9. Three numbers are said to be related if the product of the first two is equal to the sum of the last two. For example the three numbers of the triple (3, 4, 8) are related because $3 \times 4 = 4 + 8$. Which of the following triples does not contain three related numbers?

   (A) (2, 3, 3)   (B) (2, 5, 5)   (C) (3, 3, 6)   (D) (4, 5, 15)   (E) (4, 6, 20)

10. Apples cost $1 each and oranges $1.25 each. You buy two apples and three oranges and you pay with a $10 bill. How much change does the seller give back to you?

   (A) $3.25   (B) $4   (C) $4.25   (D) $5.25   (E) $6.25
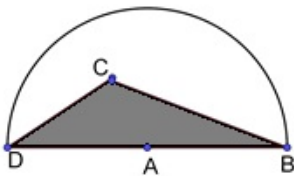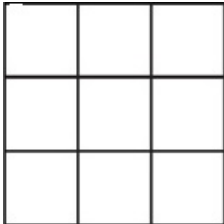
Part B

11. Lina and Lana call each other. Their phones emit a beep as soon as the connection is established. Lina's phone issues this signal every 15 minutes and Lana's does every 12 minutes. After how many minutes of conversation will their phones beep together?

    (A) 20   (B) 40   (C) 60   (D) 80   (E) 100

12. A worker at a retail store worked 49 hours last week. 35 hours were regular hours, 6 were paid time and a half and the rest at double time. Find the worker's gross earnings during the past week if his regular hourly rate of pay was $12.

    (A) $520   (B) $620   (C) $720   (D) $820   (E) $920

13. Two planes depart at 9 am from cities A and B located 4,500 km apart. The first plane goes from A to B. Its speed is 1,100 km/h. The second plane goes from B to A. Its speed is 900 km/h. At what time do they meet?

    (A) 11 am   (B) 11:15 am   (C) 11:30 am   (D) 11:45 am   (E) noon

14. The exams were too difficult at the Pickers School this year. Only one student passed both the math test and the science test. If 57 students failed the math test and 44 failed the science test and there are 100 students at this school, how many students failed both the math test and the science test?

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

15. In the decimal system we use the powers of 10 increasing from the right to the left and the possible digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Thus, the number 123 is equal to $(3 \times 1) + (2 \times 10) + (1 \times 100) = 123$. In the binary system we use the powers of 2 instead of using the powers of 10 and the possible digits are 0 and 1. For example, 11001 is a binary number. Calculating from the right, using the increasing powers of 2, this number is equal to $(1 \times 1) + (0 \times 2) + (0 \times 4) + (1 \times 8) + (1 \times 16) = 25$. What is the binary number 10101 equal to?

    (A) 11   (B) 21   (C) 31   (D) 41   (E) 51

16. Lina wants to arrange a certain number of tokens in a square (for example with 9 tokens she can make a square of 3 by 3). In trying to form a first square, she realizes that there are 14 tokens left. She then tries to make a second square by putting one more token per side. She then has 11 too few tokens. How many tokens did Lina have at the start?

    (A) 128   (B) 138   (C) 148   (D) 158   (E) 168

17. Pinocchio's nose is 5 cm long. When Pinocchio tells a lie, his nose get longer by by 3 cm ; but when he tells the truth, his nose is shortened by 2 cm. At the end of the day, Pinocchio told 7 lies and his nose is 20 cm long. How many times did Pinocchio tell the truth during this day ?

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

18. You roll two six-sided dice. How many different ways can you get a sum equal to 8 ?

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

19. What is the perimeter, in centimeters, of the quadrilateral shown below ?

1 cm

(A) $7 + \sqrt{10}$ (B) $8 + \sqrt{5}$ (C) 11   (D) $8 + \sqrt{10}$ (E) 12

20. Ed writes all the numbers from 1 to 100 one after the other (12345 ... 9899100). How many times did he write the digit 5 ?

(A) 10   (B) 18   (C) 19   (D) 20   (E) 25

Part C

21. How many rectangles (including squares) are in the following figure ?

    (A) 16   (B) 26   (C) 36   (D) 46   (E) 56

22. The coordinates of the points in the figure below are A : (0, 0), B : (4, 0), C : (-1, 2), D : (-4, 0). The radius of the semi-circle is 4. What is the area of white region inside the semi-circle ?

    (A) $8\pi - 16$ (B) $8\pi - 12$ (C) $8\pi - 8$ (D) $16\pi - 16$ (E) $16\pi - 12$

23. How many numbers from 1 to 61 are multiples of two or three but not both ?

    (A) 20   (B) 25   (C) 30   (D) 40   (E) 50

24. In a magic square, when you add up all the numbers in a row, a column, or a diagonal, you always get the same result. The square below is magic and contains all the natural numbers from 1 to 16. We have already placed some of them.
What should the number in the shaded box be ?

7	12	1	14
	13		11
	3		
9			

(A) 2   (B) 8   (C) 10   (D) 15   (E) 16

25. Two dimes with a nickel or five nickels give you two distinct ways of having a sum of 25 cents. In how many distinct ways can you have a sum of 50 cents using nickels, dimes and quarters ?

(A) 5   (B) 7   (C) 9   (D) 10   (E) 11

26. The fuel consumption rate represents the number of liters of gasoline needed to travel 100 km. If a gallon equals 4.5 liters and a mile equals 1.6 kilometers, what is the rate of fuel consumption (in liters per 100 km, to the nearest integer) of a car doing 20 miles per gallon ?

(A) 12   (B) 14   (C) 16   (D) 18   (E) 24