# Part A

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

(A) $\frac{3}{10}$ (B) $\frac{2}{5}$ (C) 1 (D) $\frac{5}{2}$ (E) $\frac{10}{3}$

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2. What is the last digit in the product 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1 ?

(A) 0 (B) 2 (C) 4 (D) 6 (E) 8

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3. What is the value of $\frac{4}{5}+\frac{5}{4}$ ?

(A) $\frac{19}{10}$ (B) $\frac{39}{20}$ (C) 2 (D) $\frac{41}{20}$ (E) $\frac{21}{10}$

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4. A country with 135 million persons has an area of 150000 square kilometres. The population density expressed in the number of persons per square kilometre is

(A) .09 (B) .9 (C) 9 (D) 90 (E) 900

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5. During a sale, the price of a book is reduced by 25%. The new price is then further reduced by 40%. The cost of the book as a percentage of the original price is

(A) 35% (B) 37.5% (C) 45% (D) 55% (E) None of these

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6. Which of the following expressions has the greatest value?

(A) $(2^2)^5$ (B) $(2.5)^2$ (C) $\dfrac{2}{(\frac{1}{10})}$ (D) $(5^2)(2^5)$ (E) $(5^2)^2$

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7. To the nearest integer, 125% of 25 is

(A) 20 (B) 30 (C) 31 (D) 32 (E) None of these

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8. In a lot of 60 apples, 1/4 of the apples are too small, 1/3 are not ripe and 1/10 are rotten. If no apple has two or more of these defects, how many perfect apples are there?

(A) 18 (B) 24 (C) 27 (D) 30 (E) None of these

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9. Steve wants to rent a car. A rental company charges $20.25 per day plus 14 cents per kilometre. Another rental company charges $18.25 per day plus 16 cents per kilometre. How many kilometres does Steve have to travel in order for the rental costs from both companies to be the same?

(A) 100 (B) 200 (C) 250 (D) 400 (E) None of these

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10. The next number in the sequence 4, 5, 8, 13, 20, 29, … is

(A) 38 (B) 39 (C) 40 (D) 42 (E) 49

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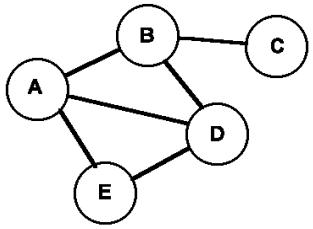
# Part B

11. The map shows the roads which connect 5 cities. A tour consists of visiting each of the cities by road exactly once. For instance AEDBC represents a tour. How many different tours are possible?




(A) 2 (B) 4 (C) 6 (D) 8 (E) None of these

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12. An automobile travels 10 km at a speed of 100 kph, 40 km at 80 kph and a third distance at 50 kph. If the average velocity for the trip is 70 kph, what is the length of the third distance travelled?

(A) 10 km (B) 20 km (C) 30 km (D) 40 km (E) None of these

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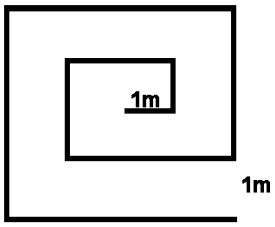
13. A path which is 1m. wide is partly surrounded by a fence shown in the diagram at right. What is the length of the fence?




(A) 20 m (B) 21 m (C) 22 m (D) 23 m (E) 24 m

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14. a/b is a fraction. If 2 is added to the numerator, the value of the fraction is ½. If 3 is added to the denominator, the fraction has a value of 1/3. The value of the sum a + b is:

(A) 18 (B) 19 (C) 20 (D) 22 (E) 25

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15. Everyday, Lisa puts her spare change (nickels and dimes) in a piggy-bank. This weekend she decides to count her savings. She finds that she has 72 coins with a total value of $4.95. How many dimes does she have?

(A) 14 (B) 23 (C) 25 (D) 27 (E)

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16. Ève has two more marbles than Solène. Solène has twice as many marbles as Steve. Steve has 7 less marbles than Ève. How many marbles do they have between them?

(A) 13 (B) 20 (C) 27 (D) 34 (E) None of these

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17. One day in math class, Shelley asks the teacher: "Mr. Nelson, how old are you?" Mr. Nelson responds: "This year I am three times as old as my sister. However, six years ago, I was five times as old as she was." How old is the mathematics teacher?

(A) 36 (B) 40 (C) 49 (D) 55 (E) None of these

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18. Four tennis players enter a tournament. How many different ways can the pairings be made for the first round games?

(A) 3 (B) 6 (C) 8 (D) 12 (E) 24

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19. A box contains some apples. Andrée takes ½ of them along with one extra apple. Beatrice takes 1/3 of the remaining apples along but put two apples back in the box and finally, Corrine takes 5/6 of the remaining apples along with one more apple. There are now seven apples left in the box. How many apples were in the box before Andrée took her share?

(A) 16 (B) 44 (C) 110 (D) 140 (E) None of these

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20. The "floor" of a fraction is defined to be the largest integer which is not greater than that fraction. For instance, floor (10 / 3) = 3. Evaluate

floor ( floor ( 1000 / 7 ) / (floor ( 71 / 2 ) ).

(A) 4 (B) 5 (C) 7 (D) 10 (E) 500

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# Part C

21. A 4 x 4 x 4 cube consisting of smaller cubes is painted and then broken apart. How many of the smaller cubes will have exactly 2 painted sides?

(A) 8 (B) 16 (C) 20 (D) 24 (E) 32

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22. How many three digit numbers can be constructed using the digits 1, 2, 3, 4 and 5 if the same digit cannot appear twice in a row in any of the numbers?

(A) 60 (B) 65 (C) 80 (D) 120 (E) None of these

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23. A rectangular floor is completely covered with tiles whose size is 1 x 2. If the tiles are not cut and do not overlap, the size of the floor cannot be

(A) 4 x 9 (B) 8 x 8 (C) 11 x 7 (D) 16 x 5 (E) None of these

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24. How many ways can the number 10 be written as the sum of exactly three positive and not necessarily different integers if the order in which the sum is written does not matter? For instance, $10 = 1 + 4 + 5$ is one such sum. This sum is the same as $10 = 4 + 1 + 5$.

(A) 5 (B) 6 (C) 7 (D) 8 (E) 10

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25. Paul's calculator can make only two operations: add 12 to the number displayed, or subtract 7 from it. Today, it shows the number 1998. What is the minimal number of steps needed to display the number 2000?

(A) 4 (B) 12 (C) 16 (D) 21 (E) 24

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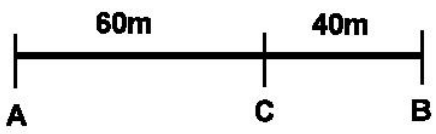
26. Alphonse starts at point A and runs at a constant rate towards point C. At the same time, Brigitte starts at point B and runs towards point C also at a constant rate. They arrive at C at exactly the same moment. If they continue running in the same directions, Alphonse arrives at B exactly 10 seconds before Brigitte arrives at A.
How fast was Brigitte running?




(A) 3 m/s (B) 10/3 m/s (C) 13/3 m/s (D) 5 m/s (E) Not enough information