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INTERMEDIATE DIVISION

Questions 1 - 10, 3 marks each

1. Which of the following is closest to 9?

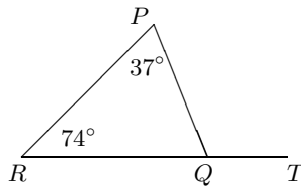
- (A) 9.2 (B) 8.17 (C) 8.7 (D) 9.21 (E) 8.71

2. $\frac{4 \times 8}{4 + 8}$ equals

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

3. In the diagram, the size of $\angle PQT$, in degrees, is

- (A) 74 (B) 107 (C) 111
(D) 101 (E) 121



4. A number is added to one third of itself. The result is 36. What is the number?

- (A) 9 (B) 18 (C) 27 (D) 15 (E) 24

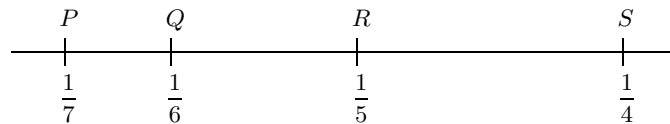
5. $5x - 3 - (3 - 5x)$ equals

- (A) 0 (B) $10x$ (C) 6 (D) $10x - 6$ (E) $6x$

6. If two sides of a triangle are 5 cm and 7 cm, the third side cannot be

- (A) 11 cm (B) 10 cm (C) 6 cm (D) 3 cm (E) 1 cm

7. On the number line below, where would 0.12 be placed?

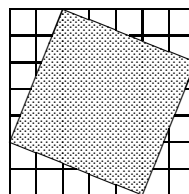


- (A) To the right of S (B) Between R and S (C) Between Q and R
(D) Between P and Q (E) To the left of P

8. Which one of the following cannot be an even number for any integer value of n ?
- (A) $2n$ (B) $3n + 2$ (C) $4n + 1$ (D) $2(n - 1)$ (E) $2(n + 1)^2$
9. When George recently visited Latvia, one Latvian *lat* was worth \$US1.50, while \$A1 was worth \$US0.60. In this case, a Latvian *lat* was worth
- (A) \$A1.80 (B) \$A2.50 (C) \$A2.75 (D) \$A2.00 (E) \$A3.00
10. Schoolteacher Mr Jones drove 54 kilometres from his house in the country to the school. If the trip takes him 45 minutes, what is his average speed in kilometres per hour?
- (A) 72 (B) 60 (C) 48 (D) 75 (E) 84

Questions 11 - 20, 4 marks each

11. Natasha buys 4 double icecreams and 2 single icecreams and pays \$16. The next day she buys 2 double icecreams and 4 single icecreams and pays \$14. The cost of a double icecream is
- (A) \$1.50 (B) \$2.00 (C) \$2.50 (D) \$3.00 (E) \$3.50
12. Adam, Lydia, Eric and Daniel share \$480 in the ratio 2 : 3 : 5 : 6 and in that order. The amount that Lydia gets is
- (A) \$90 (B) \$30 (C) \$60 (D) \$120 (E) \$150
13. What is the ratio of the shaded square to that of the largest square shown in the diagram?
- (A) 2 : 5 (B) 29 : 49 (C) 4 : 25
(D) 25 : 49 (E) $\sqrt{29} : 49$



14. If $\frac{a}{c} \diagup \frac{b}{c}$ means $\frac{ab}{c} + \frac{bc}{a} + \frac{ac}{b}$, the value of $\frac{4}{3} \diagup 12$ is
- (A) 26 (B) 16 (C) 10 (D) 9 (E) 1

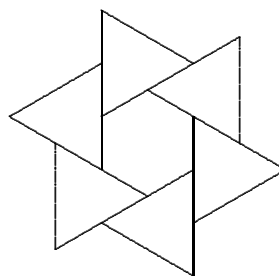
15. A sheet of glass absorbs 20% of the red light which passes through it. What is the least number of sheets which must be placed one over the other so that the red light is reduced to one half or less of its original strength?

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

16. What is the 2003rd digit to the right of the decimal point in the decimal expansion of $\frac{3}{7}$?

(A) 2 (B) 8 (C) 5 (D) 7 (E) 1

17. The side of each of the equilateral triangles in the figure is twice the side of the central regular hexagon. What fraction of the total area of the six triangles is the area of the hexagon?



(A) $\frac{1}{6}$ (B) $\frac{1}{12}$ (C) $\frac{3}{4}$
 (D) $\frac{1}{4}$ (E) $\frac{2}{3}$

18. Mum, Dad and their two children arrive at a river where there is a boat that will hold one adult or two children. What is the minimum number of trips across the river in either direction to get the family across?

(A) 7 (B) 9 (C) 11 (D) 13 (E) 15

19. When the digits of a two-digit number, neither digit zero, are reversed, the number formed is 36 less than the original number. The sum of the digits of the original number could be

(A) 4 (B) 5 (C) 12 (D) 15 (E) 18

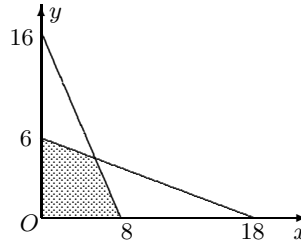
20. In a mathematical competition consisting of 12 problems, 8 marks are given for each correct response, 0 marks for each incorrect response and each no response is awarded 3 marks. Vicki scored 35 marks in this competition. The largest number of incorrect responses she could have had is

(A) 1 (B) 8 (C) 11 (D) 2 (E) 7

Questions 21 - 30, 8 marks each correct response, 0 marks each incorrect response, 3 marks each no response, 30 marks minimum for this section guaranteed

- 21.** In the diagram, the shaded area, in square units, is

(A) 38 (B) 24 (C) 42
(D) 20 (E) 34



- 22.** Three circles and three straight lines lie in a plane. The largest number of points in which they may intersect one another is

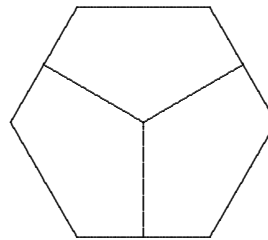
(A) 24 (B) 25 (C) 26 (D) 27 (E) 28

- 23.** How many numbers less than 10 000 have the product of their digits equal to 84?

(A) 24 (B) 30 (C) 42 (D) 72 (E) 84

- 24.** A regular hexagon is formed by three congruent pentagons as shown. What is the minimum number of these pentagons needed to form a regular hexagon larger than the one given?

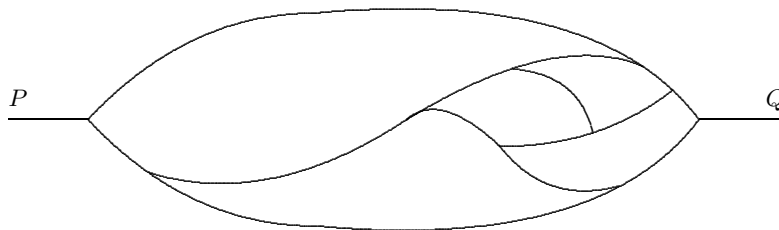
(A) 5 (B) 7 (C) 9
(D) 11 (E) 16



- 25.** Steve has a broken calculator. When just turned on, it displays 0. If the + key is pressed it adds 51. If the − key is pressed it subtracts 51. If the \times key is pressed it adds 85. If the \div key is pressed it subtracts 85. The other keys do not function. Steve turns the calculator on. The number closest to 2003 that he can get using this calculator is

(A) 1989 (B) 2001 (C) 2002 (D) 2004 (E) 2006

26. What is the largest number of cars which can leave in some order from P and arrive in the reverse order at Q if movement is allowed only from left to right and no car can pass another as the roads are too narrow?



- (A) 6 (B) 5 (C) 8 (D) 4 (E) 7
27. A four digit number N leaves remainder 10 when divided by 21, remainder 11 when divided by 23 and remainder 12 when divided by 25. The sum of the digits of N is
- (A) 7 (B) 13 (C) 16 (D) 19 (E) 22
28. The POM system of numbering is a base three system, with the digits P , O and M representing $+1$, 0 and -1 respectively. For example $PMOMP$ represents the number

$$P \times 3^4 + M \times 3^3 + O \times 3^2 + M \times 3 + P = 3^4 - 3^3 - 3 + 1 = 52.$$

When the number 2003 is represented in the POM system, what are the last two digits?

- (A) PP (B) PM (C) OP (D) MP (E) MM
29. A 3×3 square is divided up into nine 1×1 unit squares. Different integers from 1 to 9 are written in these 9 unit squares. For each two squares sharing a common edge, the sum of the integers in them is calculated. The minimum possible number of different sums is
- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7
30. For each vertex of a cube a plane is constructed through the three vertices which are neighbours of that vertex. Into how many parts do these eight planes dissect the cube?
- (A) 9 (B) 13 (C) 21 (D) 27 (E) 24