Junior Division

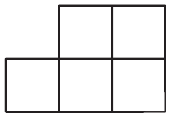
Questions 1 to 10, 3 marks each

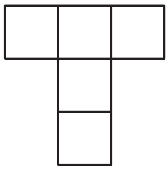
1. The value of $25 + 32$ is

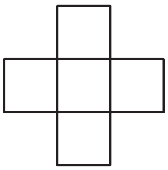
(A) 89 (B) 57 (C) 35 (D) 43 (E) 34

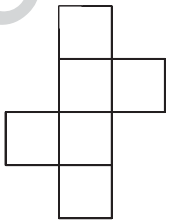
2. Which of these shapes has the largest area?

(A) 

(B) 

(C) 

(D) 

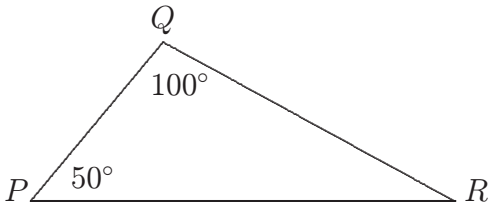
(E) 

3. Holly turned 8 years old in 2005. In what year was she born?

(A) 1996 (B) 2013 (C) 2000 (D) 1998 (E) 1997

4. The size of $\angle PRQ$, in degrees, is

(A) 20 (B) 30 (C) 40 (D) 50 (E) 60



5. A rockmelon weighs 740 g and a mango weighs 170 g. The total weight of the two fruits, in grams, is

(A) 910 (B) 800 (C) 810 (D) 570 (E) 760

6. The value of $456 + 567 - 455 - 566$ is

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

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J 2

7. If I buy three chocolate bars worth \$2.50 each and five milkshakes worth \$1.50 each, how much change do I get from a \$20 note?

(A) \$3.00 (B) \$3.50 (C) \$4.00 (D) \$4.50 (E) \$5.00

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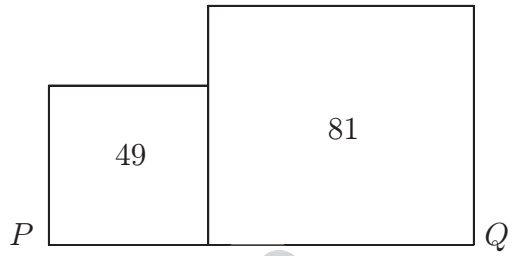
8. The figure is composed of two squares with areas shown. The length of PQ is

(A) 2 (B) 15 (C) 32 (D) 16 (E) 130



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9. A lesson finished at 10:10 am. If the duration of the lesson was 55 minutes, it started at

(A) 9:15 am (B) 9:45 am (C) 9:00 am (D) 8:45 am (E) 8:30 am

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10. During the Tai Chi move called *Jade Lady*, you rotate 180° clockwise, then 90° anticlockwise then 270° clockwise and finally 90° anticlockwise again. The single move which would get you to this position is

(A) 0° (B) 90° anticlockwise (C) 90° clockwise (D) 180° clockwise (E) 135° clockwise

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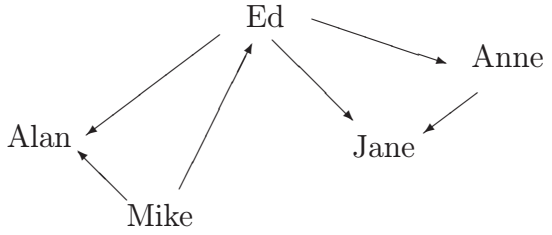
Questions 11 to 20, 4 marks each

11. If '*Anne* $\longrightarrow$ *Jane*' means '*Anne is taller than Jane*', who is the tallest?



(A) Ed (B) Alan (C) Mike (D) Anne (E) Jane

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J 3

12. The average of 6 numbers is 4.5. A further 2 numbers are added and the average is still 4.5. What is the sum of these two numbers?

(A) 27 (B) 9 (C) 36 (D) 4.5 (E) 8

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13. Seven consecutive integers are listed. The sum of the smallest three is 33. What is the sum of the largest three?

(A) 39 (B) 37 (C) 42 (D) 48 (E) 45

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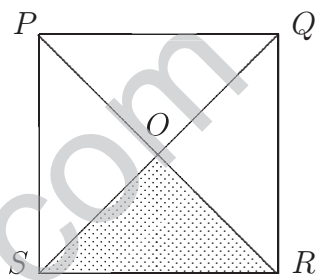
14. The diagonals of the square $PQRS$ intersect at O. The shaded region has area 16. What is the perimeter of the square?

(A) 4 (B) 8 (C) 16 (D) 32 (E) 64



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15. How many numbers are there from 10 to 99 in which the digits differ by 3?

(A) 10 (B) 11 (C) 12 (D) 13 (E) 14

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16. When 707 is divided by a secret number the remainder is 5. The secret number could be

(A) 7 (B) 8 (C) 9 (D) 10 (E) 11

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17. A bag contains six sticks of the following lengths: 1 cm, 3 cm, 5 cm, 7 cm, 11 cm and 13 cm. How many different triangles can be made using any three of these sticks?

(A) 20 (B) 11 (C) 8 (D) 1 (E) 5

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18. Hamilton High School starts at 8:30 am and finishes at 3:30 pm each day. The number of times the hour and minute hand form a right angle on the school clock during the school day is

(A) 6 (B) 11 (C) 12 (D) 13 (E) 14

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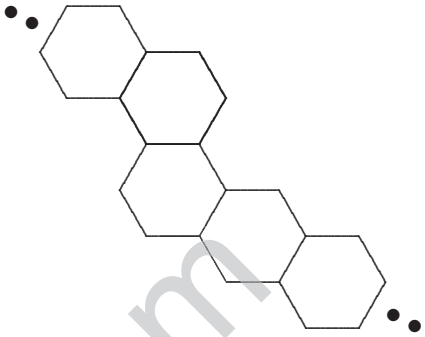
19. A large cube is constructed from 125 smaller equal cubes. The number of smaller cubes whose faces touch the faces of exactly four other cubes is

(A) 24 (B) 36 (C) 48 (D) 64 (E) 81

20. Hexagonal paving stones are laid to form a continuous path across a lawn. This path is bordered by lengths of wood, one for each side of a paving stone not touching another paving stone. If 98 pieces of wood are used, how many hexagonal paving stones are used?



(A) 24 (B) 25 (C) 16 (D) 17 (E) 49

Questions 21 to 30, 5 marks each

21. A 64 page magazine is made up of 16 sheets which have been folded over and stapled down the middle. Pages 1, 2, 63, 64 are on the same sheet. Pages 31, 32, 33, 34 are on the same sheet. The sheet with page 15 also has on it page number

(A) 14 (B) 47 (C) 48 (D) 50 (E) 52

22. The number 119 has exactly 4 factors, 1, 7, 17 and 119. Another integer which has exactly four factors is

(A) 120 (B) 125 (C) 127 (D) 121 (E) 126

23. P, Q, R and S are four different points on a straight line such that Q and R lie between P and S. $PS = 10\,\text{m}$ and $QR = 3\,\text{m}$. If, for every two of these four points, the distance between them is measured, the sum of all six such distances is

(A) 33 m (B) 52 m (C) 58 m (D) 60 m (E) 65 m

24. In the multiplication

$$\begin{array}{cccc} P & Q & R & \\ & & 3 & \times \\ \hline Q & Q & Q & \end{array}$$

each of P, Q and R represents a different digit. The sum of P, Q and R is

(A) 16 (B) 14 (C) 13 (D) 12 (E) 10

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J 5

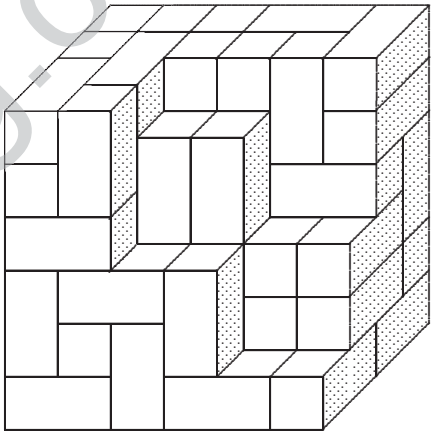
25. A 3×3 square is divided into nine 1×1 unit squares. Different integers from 1 to 9 are written into these nine unit squares. Consider the pairs of numbers in the squares sharing a common edge. What is the largest number of pairs where one number is a factor of the other number?

(A) 7 (B) 8 (C) 9 (D) 10 (E) 12

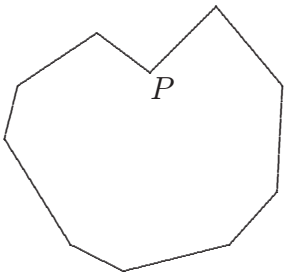
For questions 26 to 30, shade the answer as an integer from 0 to 999 in the space provided on the answer sheet.

26. In the year 2004, there were 5 Sundays in February. What are the last two digits of the next year in which this will occur?

27. I had some 2 cm by 1 cm by 1 cm bricks and decided to build a large block. When I had built this much, I ran out of bricks. How many bricks did I have to start with?



28. The decagon shown has a reflex angle at P. What is the largest possible number of reflex angles in a decagon?



29. Given a cube, how many acute angled triangles are there whose vertices are vertices of that cube?

30. A positive integer is equal to the sum of the squares of its four smallest positive divisors. What is the largest prime that divides this positive integer?

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