

ALGEBRA

1. The people eating in a certain cafeteria are either faculty members or students, and the number of faculty members is 15 percent of the total number of people in the cafeteria. After some of the students leave, the total number of persons remaining in the cafeteria is 50 percent of the original total.

The number of students who left is what fractional part of the original number of students?

- A) $\frac{10}{17}$ B) $\frac{7}{17}$ C) $\frac{7}{10}$ D) $\frac{10}{7}$

2. **What is the sum of possible solutions of the equation $(\sqrt{x})^x = (x)^{\sqrt{x}}$?**

- A) 4 B) 5 C) 6 D) 7

3. If $x - y = x - z = z - x = 3$, then **the sum $x + y + z$ is:**

- A) 3 B) 6 C) 9 D) Impossible

4. In a certain population, 40 percent of all people have biological characteristic X; the others do not.

If 8000 people have characteristic X, how many people do not have X?

- A) 4800 B) 7200 C) 12000 D) 20000



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5. The enrollments at College X and College Y both grew by 8 percent from 2000 to 2005.

If the enrollment at College X grew by 800 and the enrollment at College Y grew by 840, the enrollment at College Y was how much greater than the enrollment at College X in 2005?

- A) 400 B) 460 C) 500 D) 540

7. $(27 \times 34) - (33 \times 27) = ?$

- A) -1 B) 1 C) 27 D) 33

6. $0.04 \times 0.25 = ?$

- A) 0.0001 B) 0.001 C) 0.01 D) 0.1

8. A car dealer who gives a customer a 20 percent discount on the list price of a car still realizes a net profit of 25 percent of cost.

If the dealer's cost is \$4800, what is the usual list price of the car?

- A) \$6000 B) \$6180
C) \$7200 D) \$7500

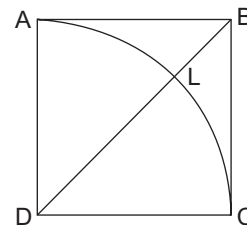
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9. A certain copy machine produces 13 copies every 10 seconds.

If the machine operates without interruption, how many copies will it produce in an hour?

- A) 468 B) 1800 C) 2808 D) 4680

11. ABCD is a square. D is the centre of quarter circle through A and C, diagonal BD intersect the quarter circle at L.



What is LB if $AB = \sqrt{2}$

- A) $\sqrt{2}$ B) 2 C) $2 - \sqrt{2}$ D) $\sqrt{2} - 2$

GEOMETRY

10. **How many triangles do exist, trisectors of one interior angle trisect the side?**

(Two line segments which divide an angle into three equal sizes are called trisectors)

- A) 0 B) 1 C) 2 D) 3

12. In trapezium ABCD, P and Q are midpoints of AC and BD respectively.

Find PQ if $AB = 3$, and $DC = 5$ and $AB \parallel DC$

- A) 4 B) 3 C) 2 D) 1

13. In quadrilateral ABCD, $AB = AC = AD$, $BC = CD$ and $\angle BAC = \angle CAD = 20^\circ$

The size of $\angle ABD$ is

- A) 70° B) 80° C) 90° D) 100°

15. Let P be an interior point of rectangle ABCD. APD is an isosceles right-angled triangle. $\triangle BPC$ is an equilateral triangle.

If $AD = 2$ cm then what is the length of AB?

- A) $\sqrt{3} + \sqrt{2}$ B) $\sqrt{3} - \sqrt{2}$
C) $1 + \sqrt{3}$ D) $\sqrt{2}$

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14. P is a point inside square ABCD. Obtuse angle of isosceles triangle DPC is 150°

What is the size of angle DAP?

- A) 15° B) 30° C) 45° D) 60°

16. If ratio of areas of two similar triangles is a quarter, then what is the ratio of two corresponding altitudes?

- A) 0.3 B) 0.4 C) 0.5 D) 0.6

NUMBER THEORY

17. p and q are prime numbers such that $p^2 - q = 4$ and q is a two - digit number.

How many such pairs (p, q) are there?

- A) 5 B) 3 C) 1 D) 0

19. What is the remainder when $3^6 - 6^3$ is divided by 7?

- A) 5 B) 4 C) 3 D) 2

18. How many divisors of 2^{1024} are divisible by 2^4 ?

- A) 10 B) 100 C) 500 D) 1020

20. What is the L.C.M of 520 and 205?

- A) 21,500 B) 21,400 C) 21,350 D) 21,320

21. Let xy and yx be two two-digit numbers such that $xy + yx = 44$

Which one of the following is $x + y$?

- A) 3 B) 4 C) 5 D) 11

22. Let A and B be two positive numbers and q be a prime number such that $A = Bq$.

If $7(A-1) = 15(B-1)$, then q is:

- A) 1 B) 2 C) 3 D) 5

23. What digit does not appear as last digit of a square number?

- A) 1 B) 4 C) 7 D) 5

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COMBINATORICS

24. How many possible numbers can be formed using digits 1, 3 and 5 only once?

- A) 15 B) 12 C) 9 D) 6



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25. In a book shelf there are 11 Maths books, 8 Physics books and 7 Chemistry books.

At least how many books should we choose to get at least one Maths book?

- A) 7 B) 8 C) 11 D) 16

27. Each side of an equilateral are divided into 3 equal segments using dots.

How many rectangles can we have using only dots as vertices?

- A) 2 B) 3 C) 4 D) 5

26. Digits (0,1,2,3,4,5,6,7,8,9) are placed on a circle with equal distances. Chords are drawn connecting 0 to other digits.

How many chords can be drawn totally?

- A) 12 B) 10 C) 9 D) 8

28. Five same size cakes will be distributed among six children equal in sizes.

Into how many equal sizes should we cut these cakes?

- A) 6 B) 4 C) 3 D) 2

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29. Juma has a plan to go on holiday for 3 days. Every day he will play beach football or volleyball, or he will rest. On any given day he does just one of these three things. He never does sports on consecutive days.

How many schedules are possible for the holiday?

- A) 12 B) 9 C) 6 D) 3

30. We have been given enough number of colors. Every diagonal of a regular pentagon is colored in one of the given colors. Whenever two diagonals intersect in the interior, they are in different colors.

What is the minimum number of colors of diagonals?

- A) 8 B) 7 C) 5 D) 3

IQ QUESTIONS

31. 1 honki is 3 ponki

1 ponki is 2 tonki

1 zonki is 12 honki

How many tonki equals to 1 zonki?

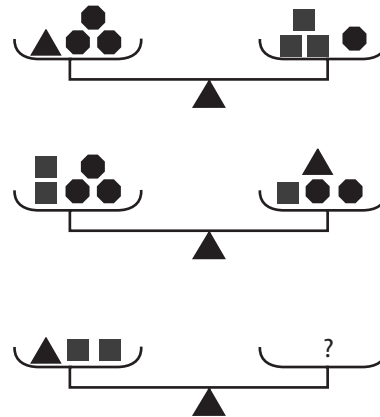
- A) 60 B) 72 C) 108 D) 144

32. Which number is different than others?

(5)(6)(3)	(6)(3)(5)	(5)(9)(4)
(8)(3)(2)	(2)(8)(3)	(9)(4)(5)
(8)(2)(9)	(2)(9)(8)	(2)(9)(4)

- A) 563 B) 829 C) 635 D) 294

33.



How should be the question mark?

- A) ■■■● B) ■■■●●●
 C) ■▲●● D) ▲●●●

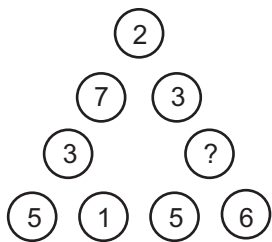
34. A drinks machine offers three selections - Tea, Coffee or Random. But the machine has been wired up wrongly so that each button does not give what it claims. If each drink costs 50Ths,

how much minimum money do you have to put into the machine to work out which button gives which selection ?

- A) 200 B) 150 C) 100 D) 50

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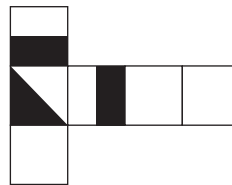
35. What number should appear in the circle with the question mark?







- A) 4 B) 5 C) 6 D) 7

37. When the shape below is folded to form a cube, just one of the following can be produced.

Which one?



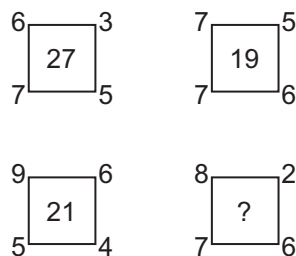
-  A)
  B)
  C)
  D)

36. Four balls are placed in a row. The red ball is next to the green ball but not next to the blue ball. The yellow ball is not next to the blue ball.

What ball is next to the yellow ball?

- A) The red ball
 B) The green ball
 C) The red and the green ball
 D) There is insufficient information to determine.

38. What number should replace the question mark?



- A) 58 B) 44 C) 34 D) 21



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