1. If $\text{Log}_x(1/8) = 3/2$, then "x" is equal to

(a) 1/6 (c) 1/7

(b) 1/4 (d) 1/4

2. 20% of 2 is equal to

(a) 0.4 (c) 0.2

(b) 0.3 (d) 0.1

3. If $\text{Log}_4 x = 12$, then $\log_2(x/4) =$

(a) 42 (c) 22

(b) 32 (d) 11

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4. The population of a country increased by an average of 2% per year from 2000 to 2003. If the population of this country was 2000000 on December 31, 2003, then the population of this country on January 1, 2000, to the nearest thousand would have been

(a) 1848000

(b) 1848250

(c) 1848500

(d) 1848750

5. "f" is a quadratic function whose graph is a parabola opening upward and has a vertex on the x-axis. The graph of the new function g defined by $g(x) = 2 - f(x - 5)$ has a range defined by the interval

(a) $[-\infty,2]$

(b) $(-\infty,2)$

(c) $(\infty,2]$

(d) $(-\infty,2]$

6. "f" is a function such that $f(x) < 0$. The graph of the new function g defined by $g(x) = | f(x) |$ is a reflection of the graph of f

(a) on the y-axis

(b) on the x- axis

(c) parallel to y-axis

(d) parallel to x-axis

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7. If the graph of y = f(x) is transformed into the graph of 2y - 6 = - 4 f(x - 3), point (a , b) on the graph of y = f(x) becomes point (A , B) on the graph of 2y - 6 = - 4 f(x - 3) where A and B are given by

(a) A=a+3, B=-2b+3

(b) A=-a+3, B=-2b+3

(c) A=a+3, B=2b+3

(d) A=a-3, B=-2b+3

8. When a parabola represented by the equation $y - 2x^2 = 8x + 5$ is translated 3 units to the right and 2 units up, the new parabola has its vertex at

(a) (5,-1)

(b) (5,1)

(c) (-5,-1)

(d) (-5,1)

9. The graphs of the two linear equations ax + by = c and bx - ay = c, where a, b and c are all not equal to zero

(a) are parallel

(b) perpendicular

(c) never intersect

(d) none of these

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10. The graphs of the two equations $y = a x^2 + b x + c$ and $y = A x^2 + B x + C$, such that a and A have different signs and that the quantities $b^2 - 4 a c$ and $B^2 - 4 A C$ are both negative,

(a) intersect at two points

(c) do not intersect

(b) Perpendicular

(d) None of these

11. For x greater than or equal to zero and less than or equal to 2 pi, sin x and cos x are both decreasing on the intervals

(a) $(\pi/2, \pi)$

(c) $(\pi, \pi/2)$

(b) $(\pi/3, \pi/2)$

(d) $(\pi/3, \pi)$

12. The three solutions of the equation f(x) = 0 are -2, 0, and 3. Therefore, the three solutions of the equation f(x - 2) = 0 are

(a) 0,3 and 5

(c) 0,2 and 5

(b) 0,2and 6

(d) 0,3 and 11

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13. The three solutions of the equation f(x) = 0 are - 4, 8, and 11. Therefore, the three solutions of the equation f(2 x) = 0 are

(a) -2,4 and 13/2

(c) -2,4 and 15/2

(b) -2,4 and 17/2

(d) -2,4 and 11/2

14. A school committee consists of 2 teachers and 4 students. The number of different committees that can be formed from 5 teachers and 10 students is

(a) 1500

(c) 5100

(b) 2100

(d) 3100

15. Five different books (A, B, C, D and E) are to be arranged on a shelf. Books C and D are to be arranged first and second starting from the right of the shelf. The number of different orders in which books A, B and E may be arranged is

(a) 3!

(c) 4!

(b) 2!

(d) 5!

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16. The mean of a data set is equal to 10 and its standard deviation is equal to 1. If we add 5 to each data value, then the mean and standard deviation become

(a) Mean = 1, S.D = 15

(b) Mean = 16, S.D = 1

(c) Mean = 15, S.D = 1

(d) Mean = 1, S.D = 16

17. The exam scores of all 500 students were recorded and it was determined that these scores were normally distributed. If Jane's score is 0.8 standard deviation above the mean, then how many, to the nearest unit, students scored above Jane?

(a) 108

(b) 106

(c) 104

(d) 102

18. If f(x) is an odd function, then | f(x) | is

(a) An even function

(b) Neither odd nor even

(c) An odd function

(d) Even and Odd

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19. The period of | sin (3x) | is

(a) $\pi/3$

(b) $2\pi/3$

(c) $4\pi/3$

(d) $5\pi/3$

20. When a metallic ball bearing is placed inside a cylindrical container, of radius 2 cm, the height of the water, inside the container, increases by 0.6 cm. The radius, to the nearest tenth of a centimeter, of the ball bearing is

(a) 1.3 cm

(b) 2.2 cm

(c) 2.3 cm

(d) 1.2 cm

21. The period of 2 sin x cos x is

(a) π

(b) 2π

(c) 3π

(d) 4π

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22. The probability that an electronic device produced by a company does not function properly is equal to 0.1. If 10 devices are bought, then the probability, to the nearest thousandth, that 7 devices function properly is

(a) 0.027

(c) 0.017

(b) 0.087

(d) 0.057

23. An overhead tank has been constructed to supply water to a village with a population of 3140 at the rate of 25 liters per head per day. Water is pumped in to it through a pipe of 10 cm diameter, the rate of flow 4 meter per second. How long will it take to fill the tank every morning?

(a) 51 minutes 10 seconds

(c) 41 minutes 10 seconds

(b) 41 minutes 40 seconds

(d) 51 minutes 40 seconds

24. Ina cylindrical wooden block of radius 7 cm and height 14 cm hemispherical blocks of radius 7 cm are carved out from both the ends. Find the volume of the resulting solid.

(a) $(238.67)\pi$ cubic cm

(c) $(228.67)\pi$ cubic cm

(b) $(248.67)\pi$ cubic cm

(d) $(218.67)\pi$ cubic cm

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25. If S_1, S_2, S_3 are the sums of the first "n" natural numbers, their squares and cubes respectively, then the value of $9(S_2)^2$ is

(a) $S_3(1-8S_1)$

(c) $S_3(1+8S_1)$

(b) $-S_3(1+8S_1)$

(d) None of these

26. On each birthday Mr. Kumar gave his son square the amount of his age. Find the total amount Mr. Kumar gave his son by the time he was 17 years old.

(a) 2785

(c) 1875

(b) 2875

(d) 1785

27. A rubber ball dropped from a height of 50 m rebounds at every impact from the floor to a height half of that from which it has fallen. Find the total distance described by the time it comes to rest.

(a) 150 m

(c) 320 m

(b) 380 m

(d) 120 m

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28. The angles of a quadrilateral are in Arithmetic progression whose common difference is 10°. Find the angles.

(a) 70, 80, 90, 100

(b) 60, 70, 80, 90

(c) 75, 85, 95, 105

(d) 65, 75, 85, 95

29. Find the quotient and remainder when -1262 is divided by 3.

(a) -421, 2

(b) -425, 1

(c) -422, 1

(d) -421, 1

30. In the day arithmetic, evaluate 3⊕11

(a) Monday

(b) Saturday

(c) Sunday

(d) Tuesday

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31. Solve : $4x \equiv 2(\text{mod}3)$

(a) 5

(b) -5

(c) 3

(d) -3

32. Find the value of $\sqrt{3}\sqrt{3}\sqrt{3}\ldots\ldots\ldots$

(a) 9

(b) 1.732

(c) 3

(d) None

33. Find the value of "m", if $f \circ g = g \circ f$, when $f(x) = 2x+3$ and $g(x) = 5x+m$.

(a) 43

(b) 28

(c) 30

(d) 12

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34. The sum of the three numbers is 24. Among them one number is equal to half of the sum of other two numbers but four times the difference of them. Find the numbers.

(a) 8, 9, 7

(b) 5, 2, 3

(c) 5, 2, 3

(d) 1, 4, 5

35. Find the quotient and remainder when x^3+x^2-3x+5 divided by $x-1$.

(a) x^2-2x-1, 4

(b) x^2-2x+1, -4

(c) x^2+2x-1, 4

(d) x^2+2x+1, 4

36. Find the value of "a" and "b" if $3x^4+x^3+ax^2+5x+b$ is exactly divisible by $(x+2)$ and $(x-1)$.

(a) -7, -2

(b) 4, 3

(c) 7, 2

(d) -4, -3

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37. Find the G.C.D of a^3-1 and a^2-1.

(a) a-3

(c) a-4

(b) a-2

(d) a-1

38. Find the square root of 0.0169

(a) 0.15

(c) 13

(b) 0.13

(d) 15

39. If "a" and "b" are the roots of the equation $x^2-3x-4=0$, form the equation whose roots are (2a+1), (2b+1)

(a) $x^2-8x-9=0$

(c) $x^2-8x+9=0$

(b) $x^2+8x-9=0$

(d) None of these

40. If all the sides of a parallelogram touch a circle, then the parallelogram is a

(a) Quadrilateral

(c) Square

(b) Triangle

(d) Rhombus

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41. Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between their feet is 12 m, find the distance between their tops.

(a) 14 m

(c) 13 m

(b) 12 m

(d) 15 m

42. Find the equation of the straight line through the point (4,-5) and having x and y intercepts in the ratio 3:5

(a) 5x+3y-5=0

(c) 5x+3y+5=0

(b) 5x-3y-5=0

(d) None of these

43. Find the equation of the straight line passing through the point of intersection of the straight lines 2x+y-3=0 and 5x+y-6=0 and perpendicular to the line joining the points (1,2) and (2,1).

(a) x-3y=0

(c) x+y=0

(b) 2x-y=0

(d) x-y=0

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44. Find the length of a regular polygon of 25 sides inscribed in a circle of radius 8 cm.

(a) 4.9203 cm

(c) 2.6602 cm

(b) 2.0048 cm

(d) 4.18002 cm

45. The top and bottom of a tower were seen to be at angles of depression 30° and 60° from the top of a hill of height 100m. Find the height of the tower

(a) 57.62 m

(c) 65.32 m

(b) 66.67 m

(d) 45.23 m

46. If $\sin\theta = \cos\theta$ where θ is an acute angle, then find the value of $2\tan^2\theta - \sin^2\theta - 1$

(a) 1/2

(c) 1/6

(b) 1/5

(d) 1/7

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47. A card is drawn from a shuffled pack of 52 cards randomly. Find the probability that it will be any card but not king.

(a) 1/13

(c) 12/13

(b) 3/38

(d) 2/82

48. Find the number ways in which 5 persons can sit in a round table.

(a) 65

(c) 45

(b) 34

(d) 24

49. The standard deviation of 10 values is 4. If each value is increased by 3, then find the standard deviation of the new set of values.

(a) 10

(c) 2

(b) 3

(d) 4

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50. The mean and standard deviation of 100 items are found to be 40 and 10. At the time of calculations two items were wrongly taken as 30 and 70 instead of 3 and 27. Find the correct mean and standard deviation.

(a) 39.3, 9.24

(b) 49.3, 20.24

(c) 29.3, 10.24

(d) 39.3, 10.24

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Answers

1. b	2. a	3. c	4. a	5. d	6. b
7. a	8. c	9. b	10. c	11. a	12. c
13. d	14. b	15. a	16. c	17. b	18. a
19. c	20. d	21. a	22. d	23. b	24. c
25. c	26. d	27. a	28. c	29. d	30. c
31. a	32. c	33. d	34. a	35. c	36. a
37. d	38. b	39. a	40. d	41. c	42. a
43. d	44. b	45. b	46. a	47. c	48. d
49. d	50. d				

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