MATHS

BOOKS - UNITED BOOK HOUSE

Nava Nalanda School, Question Paper

Exercise

1. If $2x^4 - 7x^3 + ax + b$ is divisible by (x - 3), then the relation between a and b is

A. 3b + a = 27

B. 3a + b = 27

C. 3a + b = -27

D. 3b + a = -27

Answer:

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2. The AM of 1,2,.....,n with frequencies 1^2, 2^2 ,.....n^2 respectively is

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3. All order raw moments are affected by the change of

A. base only

B. scale only

C. both base and scale

D. none of these

Answer:

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4. A negative coefficient of skewness implies that

A. mean $>$ median

B. mean $<$ median

C. mean = median

D. none of these

Answer:

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5. The values of $\Delta\left\{\frac{f(x)}{g(x)}\right\}$ is

A. a) $\frac{f(n+h)}{g(x+h)}$

B. b) $\frac{f(x+h)-f(x)}{g(x+h)-g(x)}$

C. c) $\frac{g(x)\Delta f(x)-f(x)\Delta g(x)}{g(x)g(x+h)}$

D. d) $\frac{g(x+h)f(x+h)-g(x)f(x)}{g(x+h)f(x+h)}$

Answer:

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6. The H.M of 7 values 1/2, 1/3, 1/4, 1/5, 1/6, 1/7 and 1/8 is

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7. If the relationship between two variables y and v is v - 3y = 6 and S.D. of y is 2, then the variance of v is.....(fill in the blank)

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8. Numerically the measure of skewness in terms of quartiles cannot exceed 1 (write True or false)

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9. Find the standard deviation of the following quantities: 5, 5, 5, 7, 7, 7

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10. State Remainder theorem.

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11. What do you mean by C_4 cycle? Show C_4 cycle with the help of word digram.

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12. What is the condition that the roots of the equation $x^3 + px^2 + qx + r = 0$ are in G.P.

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13. If $x^4 + 5x^3 + 4x^2 + 8x + 24$ is divided by (x + 2), then find the remainder.

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14. What do you mean by primary data?

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15. Define the term schedule.

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16. Find out derivative of $\left(3x^2 + 5x + 78\right)$

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17. Five cards are drawn successively with replacement from a well-shuffled deck of 52 cards. What is the probability that

(i) all the five cards are spades?

(ii) only 3 cards are spades?

(iii) none is a spade?

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18. If $iz^3 + z^2 - z + i = 0$ then the value of $|z|$ is

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19. What are the merits of arithmetic mean?

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20. Write notes on : Relative dispersion and its measures.

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21. If Y = a + bx, a, b be two real constants, then prove that Range (y) = |b|, Range (x).

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22. Prove that $\log_n(n+1) > \log_{n+1}(n+2)$, for n > 1.

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23. Show that for any set of n real values x_1, x_2,.....x_n.

$$x_1^2 + x_2^2 + \ldots . + x_n^2 \geq \frac{x_1 + x_2 + \ldots . + x_n}{\sqrt{n}}$$

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24. State Remainder theorem.

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25. If a, b, c are all positive, prove that $6abc \leq bc(b+c) + ca(c+a) + ab(a+b)$

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26. Find the degree two polynomial function f(x) for which it is known that f(0) = 1, f(1) = 5,

f(2) = 11.

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27. If a variable assumes n values a, ar,..... ar^{n-1} (r < 1) with equal frequencies then verify that $AH = G^2$

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28. Write a short note on histogram of a frequency distribution.

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29. Write down the merits and demerits of mass questionnaire method.

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30. if $\sin^4 x + \sin^2 x = 1$,then prove that $\cot^4 x + \cot^2 x$=1.

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31. Two groups of 15 and 22 values have variances 9 and 16 respectively. If the group means differ by 8.2, then find the standard deviation of the combined group of values.

32. Write a general formula expressing central moments in terms of raw moments.

33. If s and R are respectively the standard deviation and range of set of n values of a variable x, then prove that $\frac{R^2}{2n} \leq s^2$.

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34. If $\bar{x}_1$ and $\bar{x}_2$ are the A.M. of two sets with n_1 and n_1 observation respectively, then prove that combined mean for two sets $(\bar{x})$ lies between $\bar{x}_1$ and $\bar{x}_2$.

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35. Derive the formula of median from ogive for a frequency distribution.

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36. Prove that all odd-ordered central moments are zero for a symmetrical distribution.

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37. Derive Lagrange's interpolation formula.

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38. Prove that $\frac{1}{n}\sum_{E_1}^{n}|x_i - A|$ attains, minimum when A = Median.

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39. If the mean and variance of one set of values be $\bar{x}_1$ and s_1^2 and those of another set

be $\bar{x}_2$ and s_2^2 respectively and each set has values 2, then prove that the variance $\left(s^2\right)$ of the combined set of values is given by $4s^2 = 2\left(s_1^2 + s_2^2\right) + d^2$ where $d = (\bar{x}_1 - \bar{x}_2)$.

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40. In a frequency table, the upper boundary of each class-interval has a constant ratio to the lower boundary. Show that the geometric mean (G) may be expressed as $\log G = A + \frac{k}{n}\sum_{i=1}^{r} f_i(i-1)$.

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