

(GCF-14, GCF-15, GCF-16, GCF-17 & GCF-17-A, VCF-3, VDCF-3)**DATE: 28.05.2023****MAXIMUM MARKS: 100****TIMING: 2 Hours****BUSINESS MATHEMATICS, REASONING & STATISTICS**

1. Ans. c

Explanation:

$$\frac{5c_2}{7c_2} = \frac{10}{21}$$

2. Ans. c

Explanation:

$$P=2$$

$$P=2(1-P)$$

$$P=2-2P$$

$$3P=2$$

$$P=2/3$$

$$q = \frac{1}{3}$$

$${}^5C_3 \left(\frac{2}{3}\right)^3 \left(\frac{1}{3}\right)^2$$

$$= \frac{80}{243}$$

3. Ans. a

Explanation:

$$A = \frac{1}{5} \quad A' = \frac{4}{5}$$

4. Ans. c

Explanation:

X	P	PX
1	1/3	1/3
2	1/3	2/3
3	1/3	3/3

$$\frac{1}{3} + \frac{2}{3} + \frac{3}{3}$$

$$= \frac{6}{3} = 2$$

5. Ans. b

Explanation:

$${}_{4C_0} p^0 q^4 = \frac{16}{81}$$

$$q = \frac{2}{3} \quad p = \frac{1}{3}$$

$$4_{C_4} \left(\frac{1}{3}\right)^4 \left(\frac{2}{3}\right)^0 = \frac{1}{81}$$

6. Ans. d

Explanation:

$$m = 150 \times \frac{2}{100} = 3 \quad p(\text{more than } 2) = 1 - \frac{e^{-3}3^0}{0!} - \frac{e^{-3}3^1}{1!} - \frac{e^{-3}3^2}{2!}$$

$$= 1 - \frac{e^{-3}3^0}{0!} - \frac{e^{-3}3^1}{1!} - \frac{e^{-3}3^2}{2!} = 0.58$$

7. Ans. c

Explanation :

The symbol $\phi(a)$ indicates the area of the standard normal curve between $-\infty$ to a

8. ANS. b

Explanation:

$$\log(a + \sqrt{a^2 + 1}) + \log(a + \sqrt{a^2 + 1})^{-1}$$

$$= \log(a + \sqrt{a^2 + 1}) - \log(a + \sqrt{a^2 + 1})$$

$$= 0$$

9. ANS. d

Explanation:

$E(x - \mu)^2$ and $E[x - E(x)]^2$ both are variance.

10. ANS. a

Explanation:

$$\text{Largest angle} = \frac{32}{90} \times 360 = 128^\circ$$

$$\text{Smallest angle} = \frac{17}{90} \times 360 = 68^\circ$$

$$\text{Difference} = 60^\circ$$

11. Ans. c

Explanation:

No of diagonals in a polygon with n sides

$$= {}^nC_{2-n} = \frac{n(n-3)}{2}$$

12. Ans. b

Explanation:

Here, we have an A.P. with $a = 3,00,000$ $d = 10,000$

And $n = 20$

Using the sum formula , we get,

$$S_{20} = \frac{20}{2} [6,00,000 + 19 \times 10,000]$$

$$= 79,00,000$$

13. Ans. b
Explanation:

$$a=3, r=\frac{1}{2}$$

$$S_n = \frac{a(1-r^n)}{1-r}$$

$$\frac{3069}{512} = \frac{3[1-\frac{1}{2^n}]}{1-\frac{1}{2}}$$

$$\frac{3069}{3072} = 1 - \frac{1}{2^n}$$

$$\frac{1}{2^n} = \frac{1}{1024}$$

$$n=10$$

14. Ans. c
Explanation:
 $a=132, l=468$
 $l = a + (n-1)d$
 $468 = 132 + (n-1)(12)$
 $n=29$

$$S_n = \frac{n}{2}(a+l)$$

$$S_{29} = \frac{29}{2}(132 + 468) = 8700$$

15. Ans. c
Explanation:

	Grade I	Grade II	
Plant A	6	3	≤ 120
Plant B	4	10	≤ 180

$$6x + 3y \leq 120$$

$$4x + 10y \leq 180$$

16. Ans. c
Explanation:
 $A \times B = \{ (2,4), (2,5), (3,4), (3,5) \}$
 $B \times C = \{ (4,5), (4,6), (5,5), (5,6) \}$
 $(A \times B) \cup (B \times C) = \{ (2,4), (2,5), (3,4), (3,5), (4,5), (4,6), (5,5), (5,6) \}$

17. Ans. c

Explanation:

$$A = P \left(1 + \frac{r}{100} \right)^n$$

$$\frac{25}{16} P = P \left(1 + \frac{r}{100} \right)^2$$

$$\left(\frac{5}{4} \right)^2 = \left(1 + \frac{r}{100} \right)^2$$

$$\frac{5}{4} = 1 + \frac{r}{100}$$

$$r = 25\%$$

18. Ans. d

Explanation:

first part = x , second part = 2600-x

$$\frac{x \times 3 \times 5}{100} = \frac{(2600 - x) \times 6 \times 4}{100}$$

$$15x = 62,400 - 24x$$

$$39x = 62,400$$

$$X = 1,600$$

$$\text{Second part} = 2,600 - 1,600$$

$$= \text{Rs. } 1,000$$

19. Ans. c

Explanation:

$$A = P \left(1 + \frac{5}{100} \right)^n$$

$$A = P \left(\frac{21}{20} \right)^n$$

$$\frac{P}{A} = \left(\frac{20}{21} \right)^n$$

20. Ans. a

Explanation:

$$\log_t^a + \log_t^b + \log_t^c = \log_t^z$$

$$\log_t^{(abc)} = \log_t^z$$

$$Z = abc$$

21. Ans. a

Explanation:

$$\text{Present value of growing property} = \frac{R}{i - g}$$

$$= \frac{60}{0.07 - 0.05} = 3000$$

22. Ans. b
Explanation:

$$\begin{aligned} \text{No. of such ways} &= \frac{(n-1)!}{2} \\ &= \frac{5!}{2} \end{aligned}$$

23. Ans. a
Explanation:
If $(b+c), (c+a), (a+b)$ are in A.p.

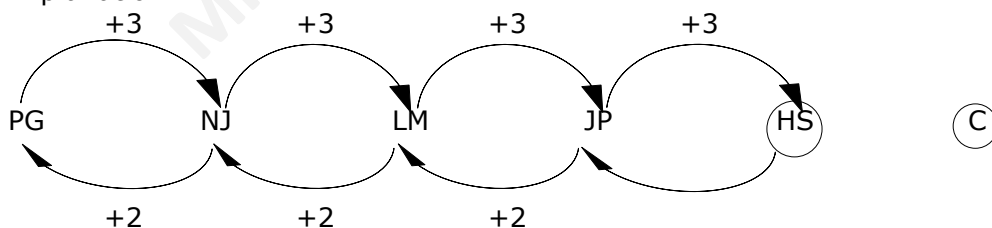
$$\begin{aligned} \text{Then } 2(c+a) &= b+c+a+b \\ 2b &= a+c \end{aligned}$$

24. Ans. c
Explanation:
 ${}^n P_r = r! \cdot {}^n C_r$
 $2880 = r! \times 120$
 $r! = 24$
 $r = 4$

25. Ans. d
Explanation:
 $\begin{aligned} \text{fog}(x) &= f[g(x)] \\ &= f[2x-3] \\ &= (2x-3)^2 + 3(2x-3) + 1 \\ &= 4x^2 - 6x + 1 \end{aligned}$
 $\text{fog}(-1) = 4 + 6 + 1 = 11$

26. Ans. d
Explanation:
Number of permutations of n distinct objects taken r at a time when a particular object is not taken in any arrangement is ${}^{n-1}P_r$
No. of arrangements = ${}^{14}P_6$

27. Ans. c
Explanation:



28. Ans. b
Explanation:

$$\frac{119}{7} = 17$$

1234567

$$\therefore \frac{60}{4} = 15$$

1234

29. Ans. d
Explanation:
STUDENT

30. Ans. a
Explanation:
AMNESTY = NMAEYTS
BRIGADE = IRBGEDA

31. Ans. b
Explanation:
Roots are -3, 1, 2 then
Factors are $x + 3$, $x - 1$, $x - 2$
and equation is $(x + 3)(x - 1)(x - 2) = 0$
 $x^3 - 7x + 6 = 0$

32. Ans. c
Explanation:
Let the total Capital be Rs. X
Then $\left(\frac{X}{3} \times \frac{7}{100} \times 1\right) + \left(\frac{X}{4} \times \frac{8}{100} \times 1\right) + \left(\frac{5X}{12} \times \frac{10}{100} \times 1\right) = 561$
 $X = 6600$

33. Ans. a
Explanation:
$$A = \frac{R}{r}[(1+r)^n - 1]$$
$$= \frac{6000}{0.09}[(1+0.09)^8 - 1]$$
$$= \text{Rs. } 66170.84$$

34. Ans. a
Explanation:
First Time
 $A = 3x$
 $P = x$
 $n = 6$
 $\therefore 3x = x \left[1 + \frac{r}{100}\right]^6$
- Second Time
 $A = 27x$
 $P = x$
 $n = ?$
 $27x = x \left[1 + \frac{r}{100}\right]^n$

$$3 = \left[1 + \frac{r}{100} \right]^6$$

$$(3)^3 = \left[1 + \frac{r}{100} \right]^n$$

$$\left\{ \left[1 + \frac{r}{100} \right]^6 \right\}^3 = \left(1 + \frac{r}{100} \right)^n$$

$$\left(1 + \frac{r}{100} \right)^{18} = \left(1 + \frac{r}{100} \right)^n \Rightarrow n = 18$$

35. Ans. b

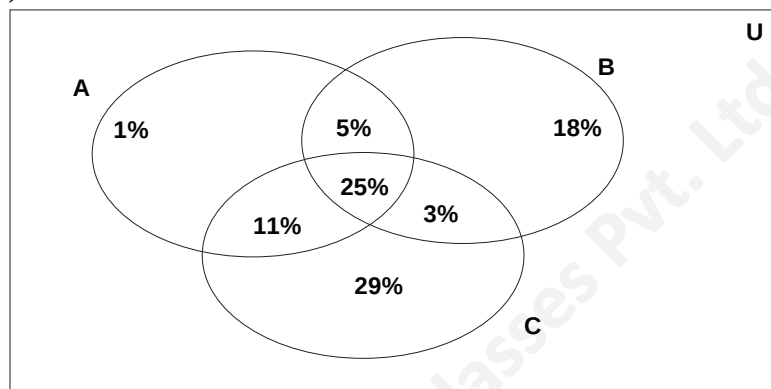
Explanation:

By formula

$$n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$$

$$92\% = 42\% + 51\% + 68\% - 30\% - 28\% - 36\% + n(A \cap B \cap C)$$

$$n(A \cap B \cap C) = 25\%$$



The percentage of persons who read only one paper
 $= 1\% + 18\% + 29\% = 48\%$

36. Ans. d

Explanation:

$(a, a), (b, b), (c, c) \in R$

So R is a reflexive relation

But $(a, b) \in R$ and $(b, a) \notin R$

Thus, R is not a symmetric relation.

Also, $(a, b), (b, c) \in R \Rightarrow (a, c) \notin R$

Hence R is not a transitive relation

37. Ans. a

Explanation:

$$n(A - B) = n(A) - n(A \cap B)$$

$$47 = 115 - n(A \cap B)$$

$$n(A \cap B) = 68$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$= 115 + 326 - 68 = 373$$

38. Ans. a

Explanation:

Using declining balance depreciation

Declining Balance Depreciation Rate = $1 - (\text{Salvage Value} / \text{Cost})^{(1/\text{Years})}$

Rearrange

Salvage value = $\text{Cost} \times (1 - \text{Depreciation rate})^{\text{Years}}$

Salvage value = $10000 \times (1 - 10\%)^{10} = 3,486.78$

39. Ans. b

Explanation:

$16000[(1 + 5\%)^3 - 1] = 2522$

40. Ans. b

Explanation:

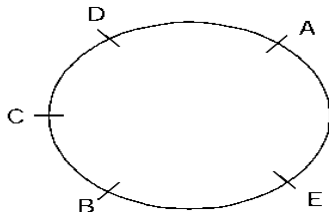
The correct pattern is $x^2 - 2$.

So, 48 is wrong and must be replaced by $(26 \times 2 - 2)$ i.e. 50.

41. Ans. d

Explanation:

Draw a figure as per given instruction in the question. We can see that according to graph C is facing towards East.



42. Ans. c

Explanation:

Common Solution for the set:

In this type of linear arrangement, we find the fixed position all are facing north

Here Y is Exactly in the Middle and it is third to the left of U

1	2	3	4	5	6	7
			Y			U

W, cannot sit at any extreme end so, T is in 1st place. W sits fifth to the right of T. W is in 6th place

1	2	3	4	5	6	7
T			Y		W	U

Z is not an immediate neighbor of Y. so, only one place left for Z that is 2.

1	2	3	4	5	6	7
T	Z		Y		W	U

Two people sit between Z and X, X is at 5th place

1	2	3	4	5	6	7
T	Z		Y	X	W	U

The last place left for V.

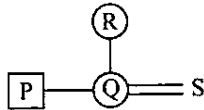
From the given information we can make the following arrangement.

1	2	3	4	5	6	7
T	Z	V	Y	X	W	U

43. Ans. d

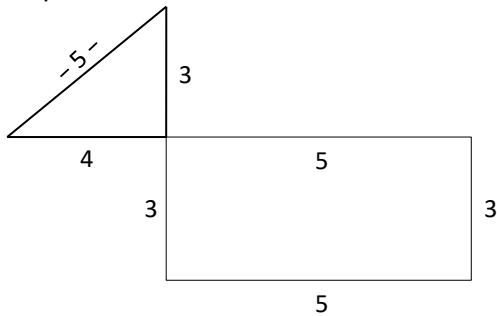
Explanation:

Mother in Law

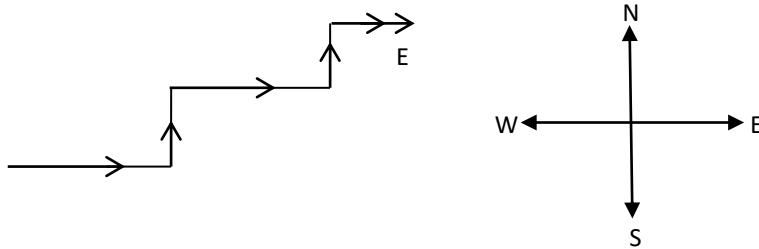


44. Ans. d
Explanation:
Since X and Y both are the young-ones of Z. Hence either X and Y will be either sons or daughters of Z. Since Y is not the son of Z. Hence Y will be the daughter of Z.
45. Ans. a
Explanation:
Each letter is represented by a particular number, so using the codes already given,
M = 7
O = 2
L = 4
E = 9
K = 5
So, the code for MOLEK is 7 2 4 9 5.
46. Ans. c
Explanation:
Given: Mode - Mean = 63
We know the empirical relationship between mean, Median & Mode i.e.
(Mode - Mean) = 3 (Median - Mean)
Median - Mean = $\frac{63}{3} = 21$
47. Ans. a
Explanation:
$$b_{vu} = \frac{p}{q} \times b_{yx}$$
$$= \frac{-3}{2} \times -1.2 = 1.8$$
48. Ans. c
Explanation:
 $np - npq = \frac{5}{9}$
 $p = \frac{1}{3}, q = \frac{2}{3}$
Distribution is $\left(\frac{2}{3} + \frac{1}{3}\right)^5$
49. Ans. b
Explanation:
If lines coincides then the value of r is + - 1.
50. Ans. a
Explanation:
The regression line : $y - \bar{y} = b_{yx} (x - \bar{x})$
or $y - 8.8 = 1.24(x - 5.5)$
 $\Rightarrow y = 1.24x + 1.98$

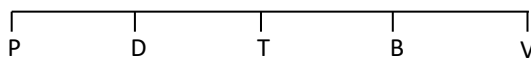
51. Ans. c
Explanation:



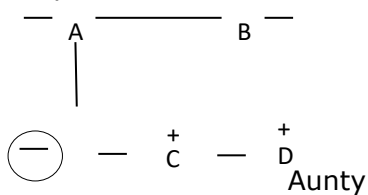
52. Ans. c
Explanation:



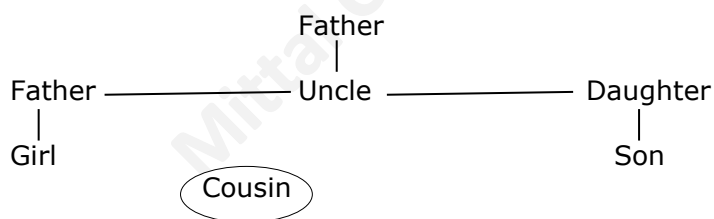
53. Ans. c
Explanation:



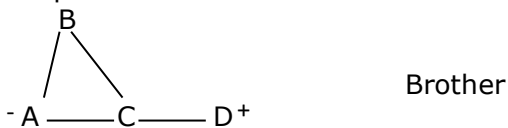
54. Ans. d
Explanation:



55. Ans. d
Explanation:



56. Ans. c
Explanation:



57. Ans. a
Explanation:
The colour of a flower is an example of An attribute.
58. Ans. b
Explanation:
The data are known to be Secondary if the data, as being already collected, are used by a different person or agency.
59. Ans. b
Explanation:
Mutually exclusive classification is usually meant for a continuous variable
60. Ans. c
Explanation:
- | | | |
|-------|----|-------------|
| 0-10 | 15 | SO=19+16=35 |
| 10-20 | 23 | |
| 20-30 | 27 | |
| 30-40 | 19 | |
| 40-50 | 16 | |
61. Ans. a
Explanation:
$$\bar{x} = A + \frac{\sum dx}{n}$$
62. Ans. c
Explanation:
$$New Mean = \frac{\bar{x}}{\alpha} \quad New Mean = \frac{\bar{x}}{\alpha} + 10$$
63. Ans. d
Explanation:
$$25000 = \frac{n_1 \times 27000 + n_2 \times 17000}{n_1 + n_2} \quad SO \quad n_1 = 80\% \quad n_2 = 20\%$$
64. Ans. b
Explanation:
$$\bar{x}_{com} = \frac{K\bar{x} + 10K\bar{y}}{11K} \quad \bar{x}_{com} = \frac{\bar{x} + 10\bar{y}}{11}$$
65. Ans. b
Explanation:
For ordering shoes of various sizes for resale, mode size will be more appropriate
66. Ans. a
Explanation:

$$\frac{15+25}{2} = 20 \quad SD = \frac{\text{range}}{2} = \frac{10}{2} = 5$$

67. Ans. a

Explanation:

52, 56, 68, 70, 75, 80, 82

Median = 70

X	X-M
52	18
56	14
68	2
70	0
75	5
80	10
82	12
	61

$$MD = \frac{61}{7} = 8.71428$$

$$MDCoefficient = \frac{8.71428}{70} \times 100$$

68. Ans. b

Explanation:

$$40 \times 100 = 4000 - 50 + 40 = \frac{3990}{100} = 39.90$$

$$\bar{x} = 39.90$$

$$\sigma = \sqrt{\frac{\sum x^2}{n} - \bar{x}^2}$$

$$5.1 = \sqrt{\frac{\sum x^2}{100} - 1600}$$

$$\sum x^2 = 162601 - 2500 + 1600 = 161701$$

$$\sigma = \sqrt{\frac{161701}{100} - 1592.01}$$

$$\sigma = 5$$

69. Ans. a

Explanation:

$$A = \frac{2}{5} \quad A' = \frac{3}{5}$$

$$B = \frac{7}{10} \quad B' = \frac{3}{10}$$

$$AB' + BA'$$

$$\frac{2}{5} \times \frac{3}{10} + \frac{7}{10} \times \frac{3}{5}$$

$$SO \quad \frac{6}{50} + \frac{21}{50} = \frac{27}{50}$$

70. Ans. a
Explanation:

$$\frac{13}{52} \times \frac{12}{51} = \frac{1}{17}$$

71. Ans. b
Explanation :

$$r_R = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

$$0.8 = 1 - \frac{6 \sum d^2}{990}$$

$$\sum d^2 = 33$$

$$\text{Cor. } \sum d^2 = 33 - (7)^2 + (9)^2 = 65$$

$$\text{Cor. } r_R = 1 - \frac{6 \times 65}{990}$$

$$= 0.61$$

72. Ans. d
Explanation:

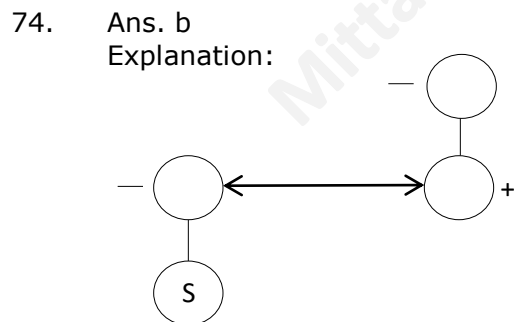
$$P_{01} = \sqrt{\frac{\sum P_1 q_0}{\sum P_0 q_0} \times \frac{\sum P_1 q_1}{\sum P_0 q_1}} \times 100 = 94.88$$

73. Ans. d
Explanation:
 Using Formula : Real wage = $\frac{\text{Money wage}}{\text{Price Index}} \times 100$

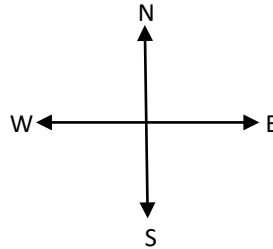
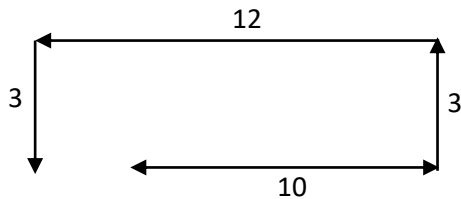
$$\Rightarrow 1680 = \frac{\text{Money Wage}}{\left(\frac{215}{120} \times 100\right)} \times 100$$

$$\therefore \text{Money Wage} = \frac{215}{120} \times 1680 = 3010 \text{ Rs.}$$

$$\therefore \text{Loss of worker} = 3010 - 3000 = 10 \text{ Rs.}$$



75. Ans. c
Explanation:



76. Ans. c
Explanation:
26

77. Ans. d
Explanation:
XC

78. Ans. a
Explanation:
The most appropriate diagram to represent 5 year plan outlay of India in different economic sectors is Pie diagram

79. Ans. d
Explanation:
GM cannot be determined if data set have positive and negative observations

80. Ans. a
Explanation:
 $\sigma x = 3$
 $y = 5 - 2x$
 $\sigma y = \frac{2}{1} \times 3 = 6$
 $\sigma y = 36$

81. Ans. c
Explanation:
 $\sum dx^2 = 250$ $n = 10$
 $\bar{x} = 50$
 $\sigma = \sqrt{\frac{250}{10}} = 5$
 $C.V. = \frac{5}{50} \times 100 = 10$

82. Ans. a
Explanation:
 $5x + 7y - 22 = 0$
 $6x + 2y - 22 = 0$

$$r = \sqrt{\frac{10}{42}}$$

$$b_{yx} = \frac{-5}{7}$$

$$b_{xy} = -\frac{2}{6} \quad -\frac{5}{7} = -\frac{\sqrt{\frac{10}{42}} \times \sqrt{15}}{\sigma_x} \quad \sigma_x = 2.646$$

83. Ans. b
Explanation:
 $b_{yx} = 0.80$

$$p = \frac{1}{-3}$$

$$q = \frac{5}{-2}$$

$$b_{yx} = \frac{q}{p} \times b_{uv}$$

$$0.80 = \frac{\frac{-5}{-2}}{\frac{1}{-3}} \times b_{uv} \quad b_{uv} = 0.1066$$

84. Ans. d
Explanation:
 $np = 3$

$$\sqrt{npq} = 1.5$$

$$3q = 2.25$$

$$q = \frac{2.25}{3} \quad q = 0.75, p = 0.75 \text{ so } n = 12$$

85. Ans. b
Explanation:

$$\text{Mean} = 6 \times \frac{1}{2} = 3$$

$$SD = \sqrt{6 \times \frac{1}{2} \times \frac{1}{2}} = 1.22$$

86. Ans. b
Explanation:

$$np = \frac{10}{3}$$

$$2n_{c_2} p^2 q^{n-2} = n_{c_3} p^3 q^{n-3}$$

$$\frac{2 \times n!}{2! n-2!} q = \frac{n!}{3! n-3!} p$$

$$\frac{q}{n-2} = \frac{p}{6}$$

$$6q = n p - 2 p$$

$$6q = \frac{10}{3} - 2 p$$

$$6q = \frac{10-6p}{3}$$

$$18q = 10 - 6 p$$

$$18 - 18 p = 10 - 6 p$$

$$12 p = 8$$

$$p = \frac{2}{3} \quad q = \frac{1}{3}$$

$$n \times \frac{2}{3} = \frac{10}{3}$$

$$n = 5$$

$$5_{c_0} \left(\frac{2}{3}\right)^0 \left(\frac{1}{3}\right)^5 + 5_{c_1} \left(\frac{2}{3}\right)^1 \left(\frac{1}{3}\right)^4 + 5_{c_2} \left(\frac{2}{3}\right)^2 \left(\frac{1}{3}\right)^3$$

$$\frac{1}{3^5} + 5 \times \frac{2}{3^5} + \frac{10 \times 4}{3^5}$$

$$\frac{1+10+40}{3^5} = \frac{51}{3^5} = \frac{51}{243} = \frac{17}{81}$$

87. Ans. c

Explanation:

$$\int \frac{dx}{x^2 + 2x - 3} = \int \frac{dx}{x^2 + 2x + 1 - 4}$$

$$= \int \frac{dx}{(x^2 + 1)^2 - 2^2}$$

$$\therefore \int \frac{dx}{x^2 - a^2} = \frac{1}{2a} \log \left(\frac{x-a}{x+a} \right) + c$$

$$= \frac{1}{4} \log \frac{x-1}{x+3} + c$$

88. Ans. b

Explanation:

$$T_5 = a + 4d = 14 \dots\dots\dots (i)$$

$$T_{12} = a + 11d = 35 \dots\dots\dots (ii)$$

On solving equation (i) and (ii)

$$a = 2$$

89. Ans. d

Explanation:

$$S_n = \sum n(n+1)$$

$$S_n = \sum n^2 + \sum n$$

$$S_n = \frac{n(n+1)(2n+1)}{6} + \frac{n(n+1)}{2}$$

$$= \frac{n(n+1)(n+2)}{3}$$

90. Ans. d

Explanation:

$$A = \frac{R}{r} [(1+r)^n - 1]$$

$$796870 = \frac{R}{0.1} [(1+0.1)^{10} - 1]$$

$$R = 50,000$$

91. Ans. c

Explanation:

$$= \log(1+2+3) = \log 6$$

$$= \log(1 \times 2 \times 3)$$

$$= \log 1 + \log 2 + \log 3$$

92. Ans. a

Explanation:

$$\frac{A}{B} = \frac{2}{3}, \frac{B}{C} = \frac{1}{4}$$

$$A:B:C = 2:3:12$$

$$A's \text{ share} = Rs. 510 \times \frac{2}{17} = Rs. 60$$

93. Ans. d

Explanation:

$$\text{Present value} = A(1+i)^{-n} = 10000 / (1+0.025)^4$$

$$= 10000 / (1.025)^4$$

$$= 10000 / (1.1038)$$

$$= Rs. 9059.50$$

94. Ans. a

Explanation:

$$\text{Here } A = 2000, i = \frac{6}{100 \times 12} = 0.005, n = 24$$

Let Rs. P be the each payment.

$$\therefore \text{Amount : } A = P \left[\frac{(1+i)^n - 1}{i} \right] \Rightarrow 2000 = P \left[\frac{(1+0.005)^{24} - 1}{0.005} \right] = P \left[\frac{(1.005)^{24} - 1}{0.005} \right]$$

$$\Rightarrow P = \frac{2000 \times 0.005}{(1.005)^{24} - 1} \quad \text{or} \quad P = \frac{10}{1.1272 - 1} = \frac{10}{0.1272} = \text{Rs. } 78.61$$

95. Ans. b

Explanation:

$$SI = \frac{prt}{100}$$

$$\frac{3}{8} P = \frac{p \times r \times 25}{400}$$

$$r = 6\%$$

96. Ans. d

Explanation:

The required no. of ways = $4! \times 3! = 144$

97. Ans. c

Explanation:

Total line can be made by ${}^{10}C_2$

and 7C_2 lines could not be drawn because points are collinear

So Remaining $\Rightarrow {}^{10}C_2 - {}^7C_2 + 1$

$\Rightarrow 25$

98. Ans. c

Explanation:

$$\frac{(243)^{\frac{n}{5}} \cdot 3^{2n+1}}{9^n \times 3^{n-1}} = \frac{(3^5)^{\frac{n}{5}} \times 3^{2n+1}}{(3^2)^n \times 3^{n-1}} = \frac{3^{(5 \times \frac{n}{5})} \times 3^{2n+1}}{3^{2n} \times 3^{n-1}} = \frac{3^n \times 3^{2n+1}}{3^{2n} \times 3^{n-1}}$$

Here

$$= \frac{3^{n+(2n+1)}}{3^{2n+n-1}} = \frac{3^{(3n+1)}}{3^{(3n-1)}} = 3^{(3n+1)-(3n-1)} = 3^2 = 9.$$

99. Ans. b

Explanation:

Let third proportional be T

$x^2 - y^2$, $x - y$, T

$x^2 - y^2 : x - y :: x - y : T$

$(x - y)^2 = (x^2 - y^2) \times T$

$\frac{(x - y)^2}{x^2 - y^2} = T$

$\frac{x - y}{x + y} = T$

100. Ans. c

Explanation:

$$x + \frac{1}{x} = \sqrt{2} \quad (\text{squaring both sides})$$

$$\left(x + \frac{1}{x}\right)^2 = (\sqrt{2})^2$$

$$x^2 + \frac{1}{x^2} + 2 = 2$$

$$x^2 + \frac{1}{x^2} = \boxed{0}$$

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