

CA Foundation Course

DATE: 13.11.2024

(Mock Test Paper – Series: 1)

MAXIMUM MARKS: 100

TIMING: 2 Hours

PAPER 3 : QUANTITATIVE APTITUDE1. **Ans. b**

Explanation:

$$(A - B) = \{a\}$$

$$B \cap C = \{c, d\}$$

$$(A - B) \times (B \cap C) = \{(a, c), (a, d)\}$$

2. **Ans. a**

Explanation:

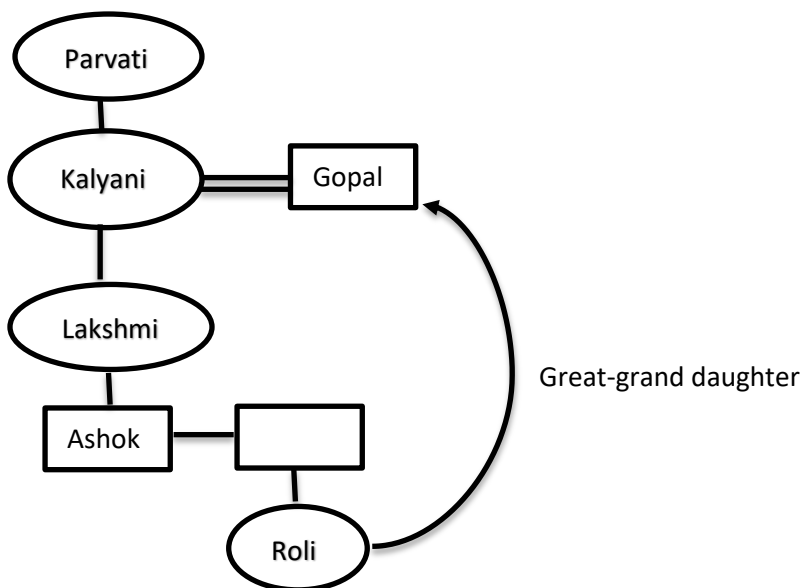
$$\text{Bowley} = \frac{L+P}{2}$$

$$250 = \frac{280+P}{2}$$

$$P = 500 - 280 = 220$$

3. **Ans. c**

Explanation:

4. **Ans. a**

Explanation:

$$r = \frac{\text{Cov}(x,y)}{\sigma_x \cdot \sigma_y}$$

$$0.28 = \frac{6.6}{3 \times \sigma_y}$$

$$\sigma_y = \frac{6.6}{3 \times 0.28} = 7.85$$

5. **Ans. c**

Explanation:

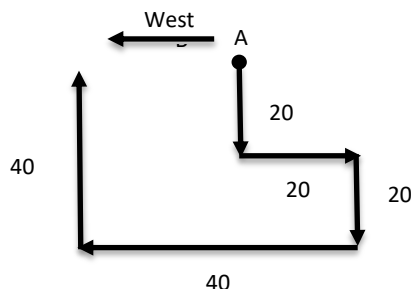
$$b_{vu} = \frac{p}{q} \times b_{yx} = \frac{-1/3}{-5/2} \times 0.80 = 0.107$$

$$p = \frac{u}{x}$$

$$q = \frac{v}{y}$$

6. **Ans. b**

Explanation:



7. **Ans. b**

Explanation:

$$r = \sqrt{-\frac{3}{2} \times -\frac{1}{6}} = -\frac{1}{2}$$

8. **Ans. b**

Explanation:

$$np = 9$$

&

$$(np)q = 8$$

$$9q = 8$$

$$q = \frac{8}{9} \text{ then } p = \frac{1}{9}$$

9. **Ans. b**

Explanation:

$$P \times 5 \times \frac{15}{100} - P \times 3.5 \times \frac{15}{100} = 144$$

$$P \left(\frac{75}{100} - \frac{52.5}{100} \right) = 144$$

$$P = \frac{144 \times 100}{22.5} = 640$$

10. **Ans. d**

Explanation:

$$b = \sqrt{ac} = \sqrt{(6 + 3\sqrt{3})(8 - 4\sqrt{3})}$$

$$\sqrt{48 - 24\sqrt{3} + 24\sqrt{3} - 12 \times 3}$$

$$\sqrt{48 - 36} = \sqrt{12} = 2\sqrt{3}$$

11. **Ans. a**

Explanation:

$$\frac{e^{-m} \cdot m^0}{L0} = \frac{e^{-m} \cdot m^2}{L2}$$

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$$m^2 = 2$$

$$m = \sqrt{2}$$

12. **Ans. d**

Explanation:

$$102000 = \frac{A}{0.05} \left(1 - \frac{1}{(1.05)^2} \right)$$

$$\begin{aligned} A &= 54856.10 \times 2 \\ &= 109712.21 - 102000 \\ &= 7712 \end{aligned}$$

13. **Ans. a**

Explanation:

$$\frac{5-2x}{3} \leq \frac{x-30}{6}$$

$$30 - 12x \leq 3x - 90$$

$$120 \leq 15x$$

$$x \geq 8$$

14. **Ans. c**

Explanation:

$$m = -4.7$$

$$\text{mode} = 4$$

15. **Ans. d**

Explanation:

$$\text{odds against even } A = \frac{UF.O}{F.O} = \frac{5}{4}$$

$$P(A) = \frac{F.O}{T.O} = \frac{4}{9}$$

16. **Ans. c**

Explanation:

$$K = \frac{R}{C}$$

$$5000000 = \frac{R}{\frac{9}{12 \times 100}}$$

$$5000000 \times \frac{9}{1200} = 37500$$

17. **Ans. c**

Explanation:

	2H	1H	0H
X	5	2	-1
P	1/4	2/4	1/4

$$M = \frac{5}{4} + \frac{4}{4} - \frac{1}{4} = \frac{8}{4} = 2$$

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18. **Ans. d**

Explanation:

$$2x^2 - 6x - 3 = 0$$

$$b^2 - 4ac$$

$$36 - 4 \times 2(-3)$$

$$36 + 24 = 60 \text{ real unequal}$$

19. **Ans. b**

Explanation:

$$\text{Prob. Of sum of the nos is divisible by 3\&4 means } 12 = \frac{1}{36}$$

20. **Ans. a**

Explanation:

$${}^4C_2 \times {}^6C_3 = \frac{4!}{2!2!} \times \frac{6!}{3!3!}$$

$$6 \times \frac{6 \times 5 \times 4}{6} = 6 \times 20 = 120$$

21. **Ans. c**

Explanation:

$$4P = P\left(1 + \frac{15}{100} \times T\right)$$

$$3 = \frac{15T}{100} = 15T = 300$$

$$T = 20$$

22. **Ans. c**

Explanation:

$$\text{Average Speed} = \frac{2ab}{a+b} = \frac{2 \times 90 \times 60}{90+60} = 72 \text{ km/hr}$$

23. **Ans. d**

Explanation:

$$50000 \left(1 + \frac{12}{100}\right)^5$$

$$88117.084 = \frac{A}{0.12} \left(1 - \frac{1}{(1.12)^5}\right) \times 112$$

24. **Ans. d**

Explanation:

Sum of Squares of 3n nos =

$$= \frac{3n(3n+1)(6n+1)}{6}$$

$$\text{A.M.} = \frac{3n(3n+1)(6n+1)}{3n \cdot 6}$$

$$= \frac{(3n+1)(6n+1)}{6}$$

25. **Ans. d**

Explanation:

If $\bar{X} < M < Z$ then negatively skewed distⁿ

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26. **Ans. a**

Explanation:

$$\mu_3 = 0 \text{ for Normal Dist}^n$$

27. **Ans. a**

Explanation:

$$123 = 13 + 5x$$

$$5x = 110$$

$$x = 22$$

28. **Ans. c**

Explanation:

$$A = 50000 \left(1 + \frac{6}{100}\right)^6 = 70926$$

29. **Ans. a**

Explanation:

R-1	Subject I	Subject II	R-2	D ²
6	3	6	3	9
4	5	4	4	0
2	8	9	1	1
5	4	8	2	9
3	7	1	6	9
1	10	2	5	16
				44

$$r_R = 1 - \frac{6 \times 44}{6(35)}$$

$$= -0.25$$

30. **Ans. d**

Explanation:

$$4 \text{ S.D} = 6 \text{ QD}$$

$$\text{S.D} = \frac{6}{4} \text{ QD} = \frac{3}{2} \text{ QD}$$

31. **Ans. a**

Explanation:

$$P(R) = 2/3$$

$$P(\bar{R}) = 1/3$$

$$P(B) = 4/5$$

$$P(\bar{B}) = 1/5$$

$$\text{Prob. Of only one} = P(R) \times P(\bar{B}) + P(B) \times P(\bar{R})$$

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

$$= \frac{2}{15} + \frac{4}{15} = \frac{6}{15} = \frac{2}{5}$$

32. **Ans. d**

Explanation:

Let S.D of given data is 'x'

S.D. of sample 1 = x (change in origin)
 -10

S.D. of sample 2 = 10x (Change in scale)
 x10

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S.D. of sample 3 = $3x$ (change in scale)
 $\times 3+5$

option (d) is correct

33. **Ans. b**

Explanation:

$$F.V = \frac{3000}{\frac{5.75}{4 \times 100}} \left(1 + \frac{5.75}{4 \times 100} \right)^{16} - 1$$

34. **Ans. d**

Explanation:

For equal observations such as K, K, K, K all the measures of dispersion will be 0 & All the measures of central tendency will be K.

35. **Ans. c**

Explanation:

$$\frac{42-20}{120} \times 360^\circ = 66^\circ$$

36. **Ans. a**

Explanation:

$$\int_1^3 \left(e^x - \frac{1}{x^2} \right) dx$$

$$\left[e^x - \left(-\frac{1}{x} \right) \right]$$

$$\left[e^x + \left(\frac{1}{x} \right) \right]$$

$$e^3 + \frac{1}{3} - e - 1$$

$$e^3 - e - \frac{2}{3}$$

37. **Ans. b**

Explanation:

$$V(y) = b^2 \cdot V(x) \\ = 3^2 \times 5^2 = 225$$

38. **Ans. d**

Explanation:

35.

39. **Ans. c**

Explanation:

The left part of a table providing the description of rows is called Stub.

40. **Ans. a**

Explanation:

Unbiasedness, consistency, efficiency and sufficiency

41. **Ans. a**

Explanation:

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$$a - \frac{7}{2}, a - 3, a - \frac{5}{2}, a - 2, a - \frac{1}{2}, a + \frac{1}{2}, a + 4, a + 5$$

$$\begin{aligned} m &= \frac{a-2+a-\frac{1}{2}}{2} \\ &= \frac{2a-\frac{5}{2}}{2} \\ &= a - \frac{5}{4} \end{aligned}$$

42. **Ans. d**

Explanation:

Probability sampling or Non-restrictive

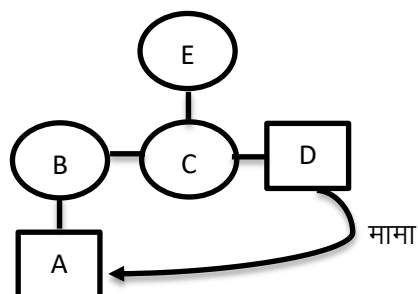
43. **Ans. a**

Explanation:

$$\begin{aligned} \text{Inter Quartile range} &= Q_3 - Q_1 \\ &= 74.25 - 42.75 \\ &= 31.50 \end{aligned}$$

44. **Ans. a**

Explanation:



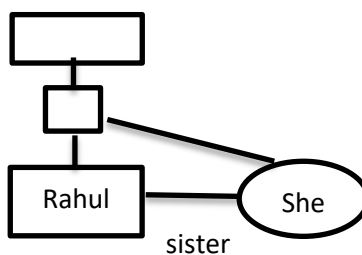
45. **Ans. b**

Explanation:

Fisher's index number does not satisfy Circular test.

46. **Ans. c**

Explanation:



47. **Ans. c**

Explanation:

$$F \div J \div H$$

48. **Ans. b**

Explanation:

$$N \div M + W$$

49. **Ans. c**

Explanation:

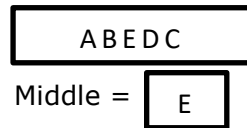
$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

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

$$\frac{1}{2} + \frac{1}{3} - \frac{2}{3} = \frac{1}{6}$$

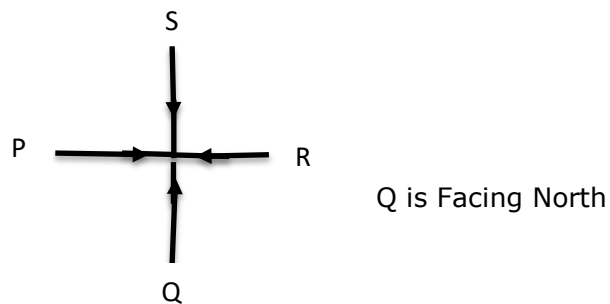
50. **Ans. d**

Explanation:



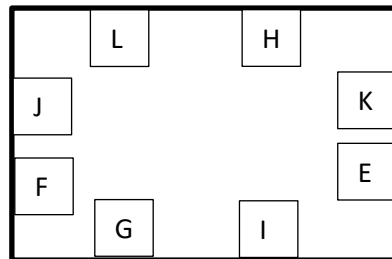
51. **Ans. b**

Explanation:



52. **Ans. c**

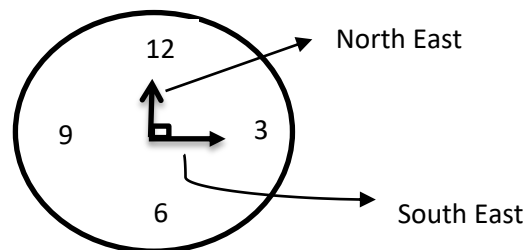
Explanation:



Immediate Left of F = J

53. **Ans. d**

Explanation:



54. **Ans. b**

Explanation:

As a sample size increases, the standard error Decreases proportionately.

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55. **Ans. c**

Explanation:

In sampling, standard deviations are known as Standard Error.

56. **Ans. b**

Explanation:

$$BC^2 = AC^2 + AB^2$$

$$BC = \sqrt{3^2 + 4^2}$$

$$BC = 5$$

North-West

57. **Ans. b**

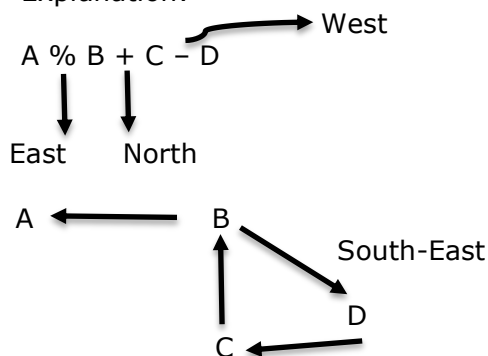
Explanation:

$$x^3 - 7x + 6 = 0$$

$$\alpha + \beta + \gamma = -\frac{b}{a} = 0 \text{ by option } 1, 2, -3 = 0$$

58. **Ans. b**

Explanation:



59. **Ans. b**

Explanation:

In a frequency distribution, the relative frequency of the class is The ratio of class frequency to the total frequency.

60. **Ans. d**

Explanation:

$$G.M = (40 \times 20 \times 36)^{1/3} = (2880)^{1/3}$$

$$(4^3 \sqrt{45})^3 = 2880$$

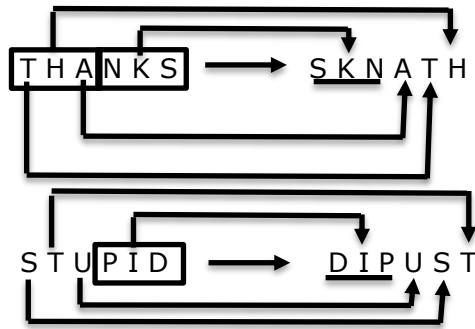
61. **Ans. a**

Explanation:

$$\begin{array}{cccccc} +1^2, & -2^2, & +3^2, & -4^2, & +5^2, & +6^2 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 50, & 51, & 47, & 56, & \mathbf{40}, & 65, & 29 \end{array}$$

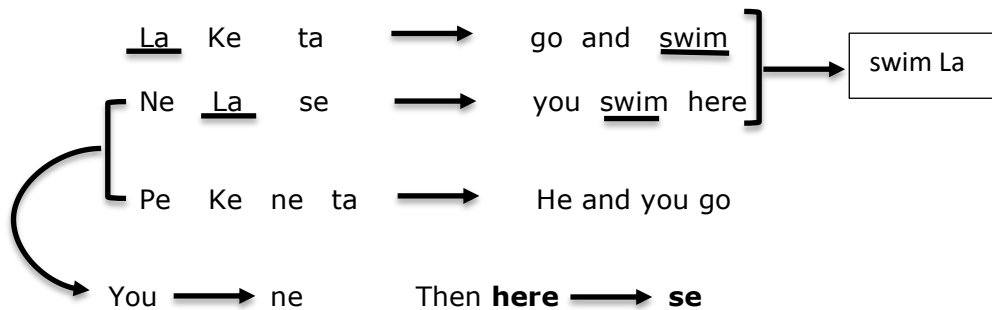
62. **Ans. c**

Explanation:



63. **Ans. d**

Explanation:



64. **Ans. b**

Explanation:

$$\text{Prob (53 fri and 53 sat)} = \frac{1}{7} \text{ (F Sa)}$$

65. **Ans. d**

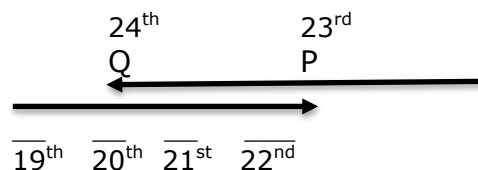
Explanation:

$$\frac{dx}{dt} = 10t \quad \frac{dy}{dt} = 24t$$

$$\frac{dy}{dx} = \frac{24t}{10t} = \frac{12}{5}$$

66. **Ans. d**

Explanation:



$$\text{Total} = 19 + 24 = 43$$

67. **Ans. c**

Explanation:

$$c(x) = 500 - 20x^2 + \frac{x^3}{3}$$

$$\frac{dc}{dx} = -40x + \frac{3x^2}{3}$$

$$\frac{d^2c}{dx^2} = -40 + 2x$$

$$-40 + 2x = 0$$

$$x = 0$$

68. **Ans. d**

Explanation:

Fisher's Index Number is an Ideal Index Number.

69. **Ans. c**

Explanation:

$$\int_2^4 \frac{x}{x^2+1} dx$$

$$x^2 + 1 = t$$

$$\frac{1}{2} \int_2^4 \frac{dt}{t}$$

$$2x dx = dt$$

$$\frac{1}{2} \log t$$

$$x dx = \frac{dt}{2}$$

$$\frac{1}{2} [\log(1 + x^2)]$$

$$\frac{1}{2} \log 17 - \frac{1}{2} \log 5$$

$$\frac{1}{2} \log \frac{17}{5}$$

70. **Ans. b**

Explanation:

$$\lim_{x \rightarrow \infty} \frac{(a - bx)}{x^2}$$

$$= -\frac{b}{2x}$$

$$-\frac{b}{2x^\infty} = 0$$

71. **Ans. a**

Explanation:

$$gF(x)$$

$$g(x + 1)$$

$$3x^2 - 2$$

$$3(x + 1)^2 - 2$$

$$3x^2 + 3 + 6x - 2$$

$$3x^2 + 6x + 1$$

72. **Ans. d**

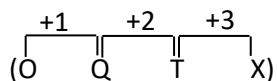
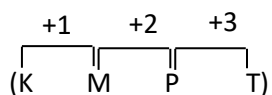
Explanation:

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

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NPSV

(C E H L)



73. **Ans. b**

Explanation:

(1,2) (2,1) (1,1) transitive

74. **Ans. d**

Explanation:

$$\begin{array}{ccccccc} 2 & - & 50 & + & 40 & \times & 10 \div 96 \\ \downarrow & & \downarrow & & \downarrow & & \downarrow \\ = & 2 \times & 50 & - & 40 \div & 10 & + 96 \end{array}$$

$$\begin{array}{l} 100 - 4 + 96 \\ 96 + 96 = 192 \end{array}$$

75. **Ans. c**

Explanation:

$$a_n = 7n - 2$$

$$a_1 = 5$$

$$a_2 = 12$$

5, 12, 19

$$s_n = \frac{n}{2}(10 + (n-1)7)$$

$$\frac{n}{2}(10 + 7n - 7)$$

$$\frac{n}{2}(7n + 3)$$

$$0.5n(7n + 3)$$

$$0.5(7n^2 + 3n)$$

76. **Ans. c**

Explanation:

4 and $-\frac{1}{2}$

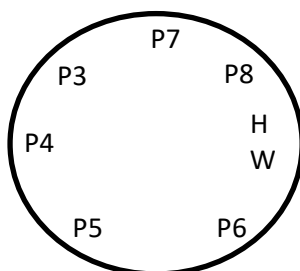
77. **Ans. a**

Explanation:

Marshall-Edge worth Index.

78. **Ans. a**

Explanation:



$$= 61 \times 21$$

$$720 \times 2 = 1440$$

79. **Ans. a**

Explanation:

$$B_1 \quad B_2 \quad B_3 \quad B_4 \quad B_5 \quad B_6 \quad B_7$$

$${}^8P_3 \times 7!$$

80. **Ans. b**

Explanation:

$$x + 2x - 4 = 11$$

$$3x = 15$$

$$x = 5$$

$${}^7C_5 = \frac{7!}{5! 2!}$$

81. **Ans. b**

Explanation:

$$12000 \times \frac{10}{100} \times 1 + (x - 12000) \times \frac{20}{100} \times 1 = x \times \frac{14}{100} \times 1$$

$$X = 20,000$$

82. **Ans. c**

Explanation:

$$a = 5, l = 905, S_n = 45955$$

$$45955 = \frac{n}{2} [5 + 905]$$

$$n = 101$$

83. **Ans. c**

Explanation:

$$E = [(1 + i)^n - 1] \times 100$$

$$E = [(1 + .02)^4 - 1] \times 100 = 8.24 \%$$

$$\text{gain in rate} = 8.24 - 8$$

$$= 0.24$$

84. **Ans. b**

Explanation:

$$\text{C.I.} = 8000 \left[\left(1 + \frac{10}{100} \right)^2 \left(1 + \frac{4}{100} \right) \right] - 1$$

$$\text{C.I.} = 2067$$

85. **Ans. b**

Explanation:

$$r = \frac{\text{Cov}(X, Y)}{\sigma_x \cdot \sigma_y}$$

86. **Ans. b**

Explanation:

$$\frac{55000}{1.1} + \frac{70000}{(1.1)^2} + \frac{15000}{(1.1)^3} - 100000 = 19121$$

87. **Ans. d**

Explanation:

$$P = D \times \left(\frac{100}{R}\right)^2 \times \left(\frac{100}{300+R}\right)$$

$$P = 132.192 \times \left(\frac{100}{6}\right)^2 \times \left(\frac{100}{306}\right) = 12000$$

88. **Ans. a**

Explanation:

$$P.V. = \frac{2000}{18} [1 - (1.18)^{-5}] = 6254$$

$$\therefore PV < 8100$$

$\therefore$ Leasing is preferable

89. **Ans. b**

Explanation:

Mean > Variance

90. **Ans. c**

Explanation:

No. of Tables = x

No. of chairs = y

$$x + y = 12 \dots\dots\dots(1)$$

$$50x + 40y = 500 \dots\dots\dots(2)$$

Solve by elimination method

$$x:y = 5:1$$

91. **Ans. b**

Explanation:

Let A's age = x

$$2x - 3(x - 6) = x$$

$$2x - 3x + 18 = x$$

$$-x + 18 = x$$

$$2x = 18$$

$$x = 9$$

92. **Ans. b**

Explanation:

$$A = P(1 - i)^n$$

$$A = 100000 (-0.9)^{10} = 34868$$

93. **Ans. d**

Explanation:

₹ 9,750

94. **Ans. b**

Explanation:

$$\alpha + \beta = -\left(-\frac{4}{2}\right)$$

$$= 2$$

$$\alpha\beta = -\frac{1}{2}$$

$$\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$$

$$= 2^3 - 3\left(-\frac{1}{2}\right)(2)$$

$$= 8 + 3 = 11$$

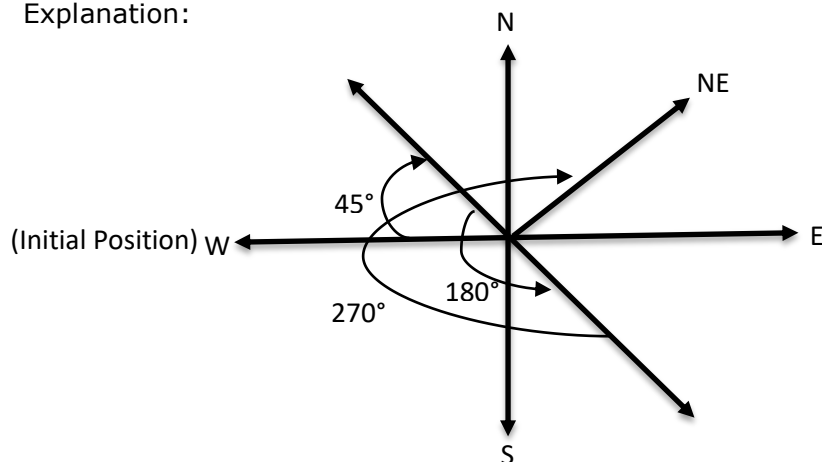
$$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$$

$$\frac{\alpha^3 + \beta^3}{\alpha\beta} = \frac{11}{-1/2}$$

$$= -22$$

95. **Ans. c**

Explanation:



96. **Ans. a**

Explanation:

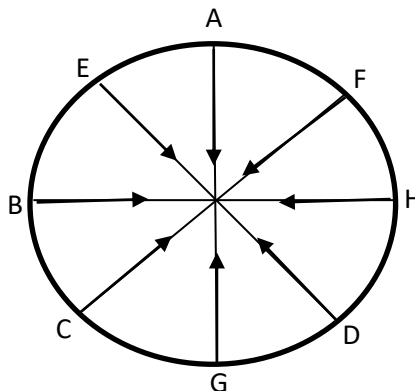
$$\log_a \sqrt{3} = \frac{1}{6}$$

$$\sqrt{3} = a^{1/6}$$

$$(\sqrt{3})^6 = a$$

$$a = 27$$

97. **Ans. d**
Explanation:



98. **Ans. c**
Explanation:
27.

99. **Ans. b**
Explanation:

5	5	4	3
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= 300

100. **Ans. b**
Explanation:

$$\left(x^{\frac{1}{3}} + y^{\frac{1}{3}}\right)^3 = \left(z^{\frac{1}{3}}\right)^3$$

$$x + y + 3x^{\frac{1}{3}}y^{\frac{1}{3}}(x^{\frac{1}{3}} + y^{\frac{1}{3}}) = z$$

$$x + y - z = 3\left(x^{\frac{1}{3}}y^{\frac{1}{3}}\right)\left(x^{\frac{1}{3}} + y^{\frac{1}{3}}\right)$$

$$x + y - z = 3x^{\frac{1}{3}}y^{\frac{1}{3}}z^{\frac{1}{3}}$$

Cube on both sides

$$(x + y - z)^3 = 27xyz$$

$$(x + y - z)^3 - 27xyz = 0$$

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