

தொடர்வைத் தேர்வு - 2014

தேர்வு - இலக்கெழு

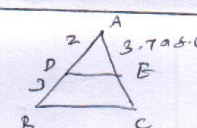
பிரிவு - 1

பின்வரும் கருவிகளைக் கவனி :

1. 25) 11	2. 25) 10	3. 25) $\frac{1}{30}$	4. 25) 0	5. 25) a^n
6. 25) $x+1$	7. 25) $k \neq 3$	8. 25) 2	9. 25) 60°	10. 25) 0, 4
11. 25) 4×4	12. 25) -7	13. 25) 1	14. 25) 60°	15. 25) 4:9

பிரிவு - II

பின்வரும் கேள்விகளைத் தீர்வு செய்து விடவும். 30 வினாக்கள் தரப்படுகின்றன.

<p>16.</p> $B \cup C = \{1, 2, 3, 4, 5, 6\}$ $A \cap (B \cup C) = \{4, 6\}$	<p>17.</p> $\{1, 4, 9, 16, 25\}$ <p>பின்வரும் சமன்பாடுகளைத் தீர்வு செய்து கொடுக்கவும்.</p>
<p>18.</p> $\sum_{k=1}^n (2k-1) = n^2$ $1+3+5+\dots+25 = 25^2 = 625$	<p>19. $2x, 5x-7, 7x$ ஆகியவை A.P. ஆகியவை.</p> $x = 14.$ <p>பின்வரும் சமன்பாடுகளைத் தீர்வு செய்து கொடுக்கவும்: $28, 70, 98.$</p>
<p>20.</p> $a = \frac{1}{A}, r = -2$ $t_n = ar^{n-1}, t_{10} = -2^7$	<p>21.</p> $\begin{vmatrix} 1 & 1 & -7 & -3 \\ 0 & 3 & 12 & 15 \\ 1 & 4 & 5 & 12 \end{vmatrix}$ <p>$15y = x^2 + 4x + 5, \sqrt{5} = 12$</p>
<p>22. இ.வ.ப. = $3x^2y^3z^2$</p>	<p>23. $m = \frac{y_2 - y_1}{x_2 - x_1}, m = -\frac{3}{2}$</p>
<p>24. $\frac{x}{a} + \frac{y}{b} = 1; 9x + 8y - 6 = 0$</p>	<p>25. $A = \begin{pmatrix} 1 & 4 & 7 \\ 1 & 2 & 5 \end{pmatrix}$</p>
<p>26.</p> $6A - 3B = \begin{pmatrix} 24 & -12 \\ 30 & -14 \end{pmatrix} - \begin{pmatrix} 24 & 6 \\ -3 & -9 \end{pmatrix}$ $= \begin{pmatrix} 0 & -18 \\ 33 & -45 \end{pmatrix}$	<p>27. $\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}} = \sqrt{\frac{(1-\cos\alpha)^2}{1-\cos^2\alpha}}$</p> $= \frac{1-\cos\alpha}{\sin\alpha} = \operatorname{cosec}\alpha - \cot\alpha.$
<p>28. $\frac{1+\sec\alpha}{\sec\alpha} = \frac{1+\frac{1}{\cos\alpha}}{\frac{1}{\cos\alpha}}$</p> $= (\cos\alpha + 1) \times \frac{1-\cos\alpha}{1-\cos\alpha}$ $= \frac{1-\cos^2\alpha}{1-\cos\alpha}$ $= \frac{\sin^2\alpha}{1-\cos\alpha}$	<p>29.</p> $\frac{AD}{DB} = \frac{AE}{EC}$  <p>$EC = 5.55 \text{ cm}$</p>

30.

$$\begin{aligned} \text{a) } \frac{x^3 - 27}{x^2 - 9} &= \frac{(x-3)(x^2+3x+9)}{(x+3)(x-3)} \\ &= \frac{x^2+3x+9}{x+3} \end{aligned}$$

$$\text{b) } y - y_1 = m(x - x_1)$$

$$y + 4 = \frac{2}{3}(x - 5)$$

$$\text{செய்யுறு = } 2x - 3y - 22.$$

31. $1972 - \text{II}$
 சென்னை 9 விமானப்படைக்கு சிறைமன்றம் கட்டி, அதை 45 கிலோமீட்டர்

31.

$$n(E \cup T \cup H) = n(E) + n(T) + n(H) - n(ET) - n(TH) - n(EH) + n(ET \cap H)$$

$$100 = 70 + n(ET \cap H)$$

$$n(ET \cap H) = 100 - 70 = 30\%$$

$$32. \text{(i) } f(5) + f(6) = 16, \text{ (ii) } f(1) - f(3) = -32$$

$$\text{(iii) } f(-2) - f(4) = 5, \text{ (iv) } \frac{f(3) + f(-1)}{2f(6) - f(1)} = \frac{2}{3}$$

$$33. d = b - a$$

$$n = \frac{b+c-2a}{b-a}; S_n = \frac{n}{2}(a+d)$$

$$S_n = \frac{b+c-2a}{2(b-a)} [a+c] = \frac{(a+c)(b+c-2a)}{2(b-a)}$$

$$34. 16^3 + 17^3 + 18^3 + \dots + 30^3$$

$$15 \text{ ஆம் சதுரவர்க்கம் க்குள்} = (1^3 + 2^3 + \dots + 30^3) - (1^3 + 2^3 + \dots + 15^3)$$

$$= \left[\frac{30 \times 31}{2} \right]^2 - \left[\frac{15 \times 16}{2} \right]^2$$

$$= 216225 - 14400$$

$$= 201825 \text{ மீ.மீ}^2$$

$$35. S_n = 7(1+11+111+\dots+n)$$

$$= \frac{7}{9}(9+99+999+\dots+n)$$

$$= \frac{7}{9}[(10-1) + (100-1) + \dots + n]$$

$$= \frac{7}{9}[10+100+1000+\dots+n] - (1+1+\dots+n)$$

$$= \frac{7}{9} \left[\frac{10(10^n-1)}{9} \right] - \frac{7n}{9}$$

$$= \frac{70}{81} [10^n - 1] - \frac{7n}{9}$$

$$= \frac{70}{81} [10^n - 1] - \frac{7n}{9}$$

36.
$$\begin{vmatrix} 1 & -23 & +142 & -120 \\ 0 & 1 & -22 & 120 \\ 1 & -22 & 120 & 0 \end{vmatrix}$$

(x-1) కి కరెక్టు అనిపిస్తోంది.
 $x^2 - 22x + 120 = (x-10)(x-12)$
 కరెక్టు అనిపిస్తోంది = $(x-1)(x-10)(x-12)$

38
 $A(-4,5) B(-4,2) C(5,-5) D(0,7)$

$$= \frac{1}{2} \left\{ \begin{matrix} -4 & 7 & -4 & -4 \\ 5 & 2 & 5 & 7 \end{matrix} \right\}$$

$= \frac{1}{2} [121]$
 $= 60.5$ చ. అ.

37.

$$= \frac{m^2 - m - 12}{m^2 - 16} \times \frac{m^2 + 8m + 16}{m^2 + m - 6}$$

$$= \frac{(m-4)(m+3)}{(m+4)(m-4)} \times \frac{(m+4)(m+4)}{(m+3)(m-2)} = \frac{(m+4)}{(m-2)}$$

39.
 BC కి సమీకరణం = $D(1,4)$
 AD కి సమీకరణం
 $A(2,1) D(1,4)$

$\frac{y-4}{y_2-y_1} = \frac{x-1}{x_2-x_1}$
 $\frac{y-4}{4-1} = \frac{x-1}{1-2}$
 సమీకరణం = $3x + y - 7 = 0$

40. $A^2 = \begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix}$

$A^2 - 4A + 5I_2 = \begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix} - 4 \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix} + 5 \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

$= \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

41. $AB = \begin{pmatrix} 8 & -3 \\ 11 & -4 \end{pmatrix}$

$(AB)^T = \begin{pmatrix} 8 & 11 \\ -3 & -4 \end{pmatrix}$ — ①

$B^T A^T = \begin{pmatrix} 2 & -1 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} 5 & 7 \\ 2 & 3 \end{pmatrix}$

$= \begin{pmatrix} 8 & 11 \\ -3 & -4 \end{pmatrix}$ — ②
 ① = ②

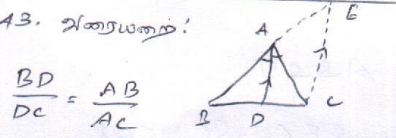
42. $(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2$

$= \sin^2\theta + \operatorname{cosec}^2\theta + 2\sin\theta \operatorname{cosec}\theta + \cos^2\theta + \sec^2\theta + 2\cos\theta \sec\theta$

$= \sin^2\theta + \cos^2\theta + \operatorname{cosec}^2\theta + \sec^2\theta + 2\sin\theta \cdot \frac{1}{\sin\theta} + 2\cos\theta \cdot \frac{1}{\cos\theta}$

$= 1 + (1 + \cot^2\theta) + (1 + \tan^2\theta) + 4$

$= 7 + \tan^2\theta + \cot^2\theta$



44. ΔABC & ΔADE ని $\angle A$ సమానం.
 $\therefore \Delta ABC \sim \Delta ADE$

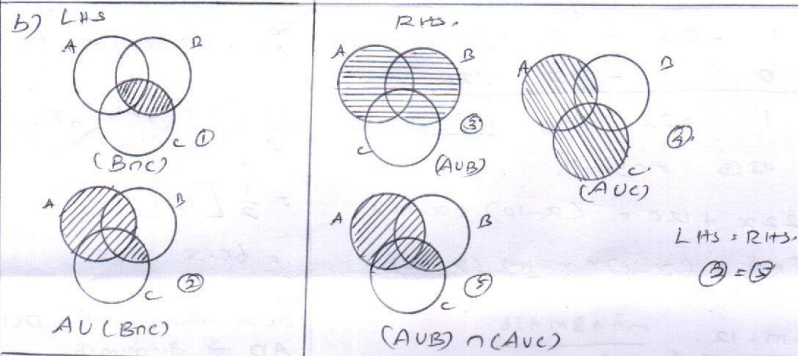
$\frac{\Delta ADE \text{ వైశు}}{\Delta ABC \text{ వైశు}} = \frac{AD^2}{AB^2} = \frac{1}{9}$

అందుకే $DBCE$ వైశు = $72 - \frac{1}{9} \times 72$
 $= 64$ చ. అ.

45
 a) $P(x,y) A(a,0) B(0,b)$ కరెక్టు కి కరెక్టు అనిపిస్తోంది.

$$= \frac{1}{2} \left\{ \begin{matrix} a & 0 & a \\ 0 & b & y \end{matrix} \right\}$$

$$= \frac{1}{2} \{ ab - bx - ay \}$$
 $\neq bx + ay = ab$ $\neq \frac{x}{a} + \frac{y}{b} = 1$ Page no 2



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

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

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

$$(-3, 12) (-2, 5) (-1, 0) (0, -3) (1, -4) (2, -3) (3, 0) (4, 5)$$

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

$$(-4, 5) (-3, 0) (-2, -3) (-1, -4) (0, -3) (1, 0) (2, 5) (3, 12)$$

$$y = x^2 + 2x - 3$$

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

$$y = 3x + 3$$

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

$$(-3, -6) (-1, 0) (0, 3) (1, 6)$$

$$\text{Solving for } x = \{-2, 3\}$$

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