

பத்தாம் வகுப்பு காலாண்டுத்தேர்வு விடைகுறிப்பு

2019-20

ஒரு மதிப்பெண் வினாவிற்களுக்கான விடைகுறிப்பு

1. (அ) இருபடி பெயர்	2. (அ) $p \times q$	3. (ஆ) 5	4. (ஆ) $(y+1y)^2$	5. (அ) 0	6. (அ) 1	7. (ஆ) $\frac{1}{27}$
8. (அ) விபம்மம்	9. (ஆ) 70°	10. (அ) 1-4 மணி	11. (ஆ) $25a-21$	12. (அ) 45°	13. (அ) $\cot \theta$	14. (அ) 0

இரண்டு மதிப்பெண் வினாவிற்களுக்கான விடைகுறிப்பு

15. $A = \{3, 4\}$ $B = \{-2, 0, 3\}$	16. $f(-2) = 4 - 2 = 2$ $f(-1) = 1 - 2 = -1$ $f(0) = 0 - 2 = -2$ $f(3) = 9 - 2 = 7$ ii) $f = \{(x, f(x)), (x, f(x))\}$ $(-2, 2), (-1, -1), (0, -2), (3, 7)$ iii) $f = \{(x, f(x))\}$ என்பது செய்தல்.	17. $4+5 = 4(1+5/4)$ $\Rightarrow 4b = 5(1+5/4)$ $572 = 5(1+5/4)$ $\Rightarrow 567 = 0$ (பயலாது) $\therefore 4b = 567$ 21. மொத்தம் = 63 $\therefore 2$ மக்களும் பிள்ளைகளும் = 63	18. $a = 16$ $d = -5$ $l = -54$ $n = \left(\frac{l-a}{d}\right) + 1$ $= \left(\frac{-54-16}{-5}\right) + 1$ $= 14 + 1 = 15$ $\therefore 507$ உட்கட்டி = 54
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19. $\frac{x^2-16}{x^2+8x+16}$ $= \frac{(x+4)(x-4)}{(x+4)(x+4)}$ $= \frac{x-4}{x+4}$	20. $x^2 - (6+6)x + (6-6) = 0$ $x^2 - (12)x + 0 = 0$ $x^2 - 12x = 0$ $x(x-12) = 0$ $x = 0$ or $x = 12$	21. $\frac{A \cdot \Delta ABC}{A \cdot \Delta DEF} = \frac{3^2}{4^2}$ $\frac{9}{16} = \frac{9}{16}$ $A \cdot \Delta DEF = 16$ $\therefore A \cdot \Delta DEF = 16 \times \frac{16}{9}$ $= 96 \text{ cm}^2$	22. $\frac{\cos \theta}{1 + \sin \theta} \times \frac{1 - \sin \theta}{1 - \sin \theta}$ $= \frac{\cos \theta (1 - \sin \theta)}{1 - \sin^2 \theta}$ $= \frac{\cos \theta (1 - \sin \theta)}{\cos^2 \theta}$ $= \frac{1 - \sin \theta}{\cos \theta}$
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23. C.V = $\frac{9}{2} \times 100\%$ $= \frac{6.5}{12.5} \times 100$ $= \frac{65}{125} \times \frac{4}{4} \times 100$ $= \frac{104}{25} \times 100$ $= 52\%$	24. $m = \tan \theta$ $m = \tan 30^\circ$ $= \frac{1}{\sqrt{3}}$	25. $m = -\frac{1}{2}$ $\frac{3-a}{4+2} = -\frac{1}{2}$ $3-a = -\frac{11}{2}$ $a = 3 + \frac{11}{2} = \frac{17}{2}$	26. $f(0) = 6$ $f(1) = 5$ $f(2) = 8$ $f(3) = 15$ $f(4) = 24$ \therefore விடைகள் $= \{0, 3, 8, 15, 24\}$
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27. $2 \times (1+2+3+\dots+12)$ $= 2 \times \frac{12 \times 13}{2}$ $= 156$ $\therefore 156$ இரண்டு மதிப்பெண் வினாக்களுக்கு	28. $x^2 + 2x - 143$ $= (x+13)(x-11)$ \therefore மூல்கள் -13 மற்றும் 11
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29. $A = \{3\}$ $B \cap D = \{3, 5\}$
 $(A \cap C) \times (B \cap D) = \{(3, 3), (3, 5)\} \rightarrow \textcircled{A}$
 $A \times B = \{(1, 2), (1, 3), (1, 4), (2, 2), (2, 3), (2, 5), (3, 2), (3, 3), (3, 5)\}$
 $C \times D = \{(3, 1), (3, 3), (3, 5), (4, 1), (4, 3), (4, 5)\}$
 $\therefore (A \times B) \cap (C \times D) = \{(3, 3), (3, 5)\} \rightarrow \textcircled{B}$
 $\therefore \textcircled{A} = \textcircled{B}$
 $\therefore (A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$

30) $f \circ g = g \circ f$
 $3(2x+k) + 2 = 2(3x-2) + k$
 $6x + 3k - 2 = 6x - 4 + k$
 $3k - k = -4 + 2$
 $2k = -2$
 $k = -1$

31) $S_1 = \frac{n}{2} [2a + (n-1)d]$
 $= \frac{n}{2} [2a + nd - d]$
 $S_2 = \frac{2n}{2} [2a + (2n-1)d]$
 $= \frac{n}{2} [4a + 4nd - 2d]$
 $3(S_2 - S_1) = 3 \left[\frac{n}{2} [4a + 4nd - 2d - 2a - nd + d] \right]$
 $= \frac{3n}{2} [2a - 3nd - d]$
 $= \frac{3n}{2} [2a + (3n-1)d]$
 $= S_3$

32) $6^2 + 7^2 + 8^2 + \dots + 21^2$
 $= (1^2 + 2^2 + \dots + 21^2) - (1^2 + 2^2 + \dots + 5^2)$
 $= \frac{21 \times 22 \times 43}{6} - \frac{5 \times 6 \times 11}{6}$
 $= 3311 - 55$
 $= 3256$

33) $3x^4 + 6x^3 + 2x^2 - 24$
 $= 3x [x^3 + 2x^2 - 4x - 8]$
 $4x^4 + 14x^3 + 8x^2 - 8x$
 $= 2x [2x^3 + 7x^2 + 4x - 4]$
 $\therefore x^3 + 2x^2 - 4x - 8$

$2x^3 + 7x^2 + 4x - 4$
$2x^3 + 4x^2 - 8x - 8$
$3x^2 + 12x + 4$
$3(x^2 + 4x + 4)$

 $x - 2$

$x^3 + 4x^2 + 4x$
$x^3 + 2x^2 - 2x - 8$
$2x^2 + 6x - 8$
$2x^2 + 8x - 8$
$2x - 8$
$2(x - 4)$

 \therefore $3x^2 + 6x + 2 = 3(x^2 + 4x + 4)$

34)

1	-5	1
1	-10	27
2	-5	27
2	-10	1

 $\therefore \sqrt{\frac{x^3}{y^2} - \frac{10x}{y} + 27 - \frac{10y}{x} + \frac{y^3}{x^2}}$
 $= \left| \frac{x}{y} - 5 + \frac{y}{x} \right|$

35 - 35 டி

29) $A = \{3\}$ $B = \{3, 5\}$
 $(A \times B) \times (B \times D) = \{(3, 3), (3, 5)\} \rightarrow \textcircled{1}$
 $A \times B = \{(1, 2), (1, 3), (1, 5), (2, 2), (2, 3), (2, 5), (3, 2), (3, 3), (3, 5)\}$
 $C \times D = \{(3, 1), (3, 3), (3, 5), (4, 1), (4, 3), (4, 5)\}$
 $\therefore (A \times B) \cap (C \times D) = \{(3, 3), (3, 5)\} \rightarrow \textcircled{2}$
 $\therefore \textcircled{1} = \textcircled{2}$
 $\therefore (A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$

30) $f \circ g = g \circ f$
 $3(2x+k) + 2 = 2(3x-2) + k$
 $6x + 3k + 2 = 6x - 4 + k$
 $3k - k = -4 + 2$
 $2k = -2$
 $k = -1$

31) $S_1 = \frac{n}{2} [2a + (n-1)d]$
 $= \frac{n}{2} [2a + nd - d]$
 $S_2 = \frac{2n}{2} [2a + (2n-1)d]$
 $= \frac{n}{2} [4a + 4nd - 2d]$
 $3(S_2 - S_1) = 3 \left[\frac{n}{2} [4a + 4nd - 2d - 2a - nd + d] \right]$
 $= \frac{3n}{2} [2a + 3nd - d]$
 $= \frac{3n}{2} [2a + (3n-1)d]$
 $+ S_2$

32) $6^2 + 7^2 + 8^2 + \dots + 21^2$
 $= (1^2 + 2^2 + \dots + 21^2) - (1^2 + 2^2 + \dots + 5^2)$
 $= \frac{21 \times 22 \times 43}{6} - \frac{5 \times 6 \times 11}{6}$
 $= 8256 - 55$
 $= 8201$

33) $3x^4 + 6x^3 - 12x^2 - 24$
 $= 3x [x^3 + 2x^2 - 4x - 8]$
 $4x^4 + 14x^3 + 8x^2 - 8x$
 $= 2x [2x^3 + 7x^2 + 4x - 4]$
 $\therefore x^3 + 2x^2 - 4x - 8$

$2x^3 + 7x^2 + 4x - 4$	$2x^3 + 4x^2 - 8x - 8$
$(2x^3 + 4x^2 + 4x - 4)$	$(2x^3 + 4x^2 + 4x - 8)$
$-3x^2 + 12x + 12$	$-3x^2 + 12x + 12$
$3(x^2 + 4x + 4)$	

$x - 2$

$x^2 + 4x + 4$	$x^2 + 2x^2 - 4x - 8$
$(x^2 + 4x + 4)$	$(x^2 + 4x^2 + 4x - 8)$
$-2x^2 - 8x - 8$	$-2x^2 - 8x - 8$
$(-2x^2 - 8x - 8)$	$(-2x^2 - 8x - 8)$

$\therefore \text{Answer} = x(x^2 + 4x + 4)$

34)

1	-5	1
1	-10	27
2	-5	
2	-10	1

$\therefore \sqrt{\frac{x^2}{9} - \frac{10x}{9} + 27 - \frac{100}{x} + \frac{51}{x^2}}$
 $= \left| \frac{x}{9} - 5 + \frac{5}{x} \right|$

35) - 60 > L

38) $AB \sin A = AC \sin B + \sin A$
 $\frac{b-9}{9+3} = \frac{-5-9}{4+3}$
 $\frac{b-9}{9+3} = \frac{-14}{7}$
 $b-9 = -2a-6$
 $2a+b=3 \rightarrow (1) \quad a+b=1 \rightarrow (2)$
 $(1)-(2) \Rightarrow \boxed{a=2} \Rightarrow 2+b=1$
 $\boxed{b=-1}$

37) $m_1 = AB \sin A = \frac{-3+4}{2-1} = 1$
 $m_2 = BC \sin B = \frac{-7+3}{4-2} = -2$
 $m_3 = AC \sin C = \frac{-7+4}{4-1} = -1$
 $m_1 \times m_3 = 1 \times -1 = -1$
 $\therefore \angle A = 90^\circ \therefore \triangle ABC$ is a right-angled triangle.

39) $p^2 - 1 = (\sin \theta + \cos \theta)^2 - 1$
 $= \sin^2 \theta + \cos^2 \theta + 2 \sin \theta \cos \theta - 1$
 $= 1 + 2 \sin \theta \cos \theta - 1$
 $= 2 \sin \theta \cos \theta$
 $q = \frac{1}{\cos \theta} + \frac{1}{\sin \theta} = \frac{\sin \theta + \cos \theta}{\sin \theta \cos \theta}$
 $= \frac{p}{\sin \theta \cos \theta}$
 $q(p^2 - 1) = \frac{p}{\sin \theta \cos \theta} \cdot 2 \sin \theta \cos \theta$
 $= 2p$

39) $x = \frac{38+40+47+44+46+43+49+53}{8}$
 $= \frac{360}{8} = 45$

x	d	d ²
38	-7	49
40	-5	25
43	-2	04
44	-1	01
46	1	01
47	2	04
49	4	16
53	8	64
Σd=0		164

$\sigma = \sqrt{\frac{\sum d^2}{n}}$
 $= \sqrt{\frac{164}{8}}$
 $= \sqrt{20.5}$
 $= 4.53$

$\therefore C.V = \frac{\sigma}{x} \times 100 = \frac{4.53}{45} \times 100 = 10.07\%$

A=10

x	d=x-A	d ²
2	-8	64
5	-5	25
6	-4	16
8	-2	4
8	0	0
10	0	1
11	1	4
12	2	16
14	4	16
Σd=-12		130

$\sigma = \sqrt{\frac{\sum d^2}{n} - \left(\frac{\sum d}{n}\right)^2}$
 $= \sqrt{\frac{130}{8} - \left(\frac{-12}{8}\right)^2}$
 $= \sqrt{16.25 - 2.25} = \sqrt{14} = 3.74$

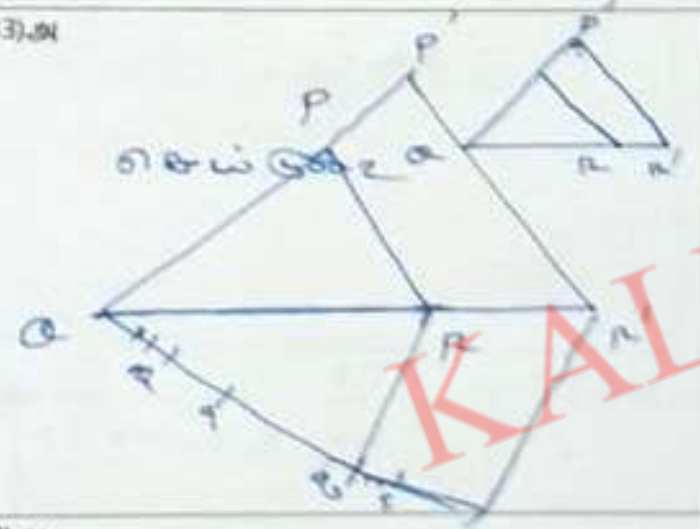
41) $5x^2 - 6x - 2 = 0$
 $x^2 - \frac{6}{5}x - \frac{2}{5} = 0$
 $\left(x - \frac{3}{5}\right)^2 - \frac{9}{25} - \frac{2}{5} = 0$
 $\left(x - \frac{3}{5}\right)^2 - \frac{19}{25} = 0$
 $\left(x - \frac{3}{5}\right)^2 = \frac{19}{25}$
 $\left(x - \frac{3}{5}\right) = \pm \sqrt{\frac{19}{25}}$
 $x = \frac{\sqrt{19}}{5} + \frac{3}{5} \quad x = -\frac{\sqrt{19}}{5} + \frac{3}{5}$
 $= \frac{3+\sqrt{19}}{5} \quad x = \frac{3-\sqrt{19}}{5}$
 $x = \frac{3+\sqrt{19}}{5}$
 $x = \frac{3-\sqrt{19}}{5}$

42) $k_4 = 54$
 $ar^3 = 54 \rightarrow \textcircled{1}$ $ar^6 = 1458$
 $\rightarrow \textcircled{2}$

$\frac{\textcircled{2}}{\textcircled{1}} \Rightarrow r^3 = \frac{1458}{54} = 27$
 $\Rightarrow \boxed{r = 3}$

$\therefore a(27) = 54$
 $\boxed{a = 2}$
 \therefore தொடர் தொடர் வரிசை
 2, 6, 18, 54, ...

எட்டு மடுப்பெண் வினாவிற்குக்கான விடை குறிப்பு



141) $x = -\frac{b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1 - 4(-1)(-1)}}{2(-1)}$
 $x = -1$ $x = 1$
 $x = -1$ $x = 1$

x	1	2	3	4	5	6	7	8	9	10
y	6	0	-4	-6	-6	-4	0	6	14	24

சூ. = $\{ -4, 1 \}$

11) $\frac{x}{x-2} = \frac{x+2}{x-1}$
 $x^2 - x = x^2 - 4$
 $\boxed{x = 4}$
 $AD = 4$ $DB = 2$ $AB = 6$
 $AE = 6$ $EC = 3$ $AC = 9$

141) $x + y - 5 = 2y - 32$ $\rightarrow \textcircled{1}$
 $x - 2y + 32 = 5$ $\rightarrow \textcircled{2}$
 $x + y - 5 = 6x + 32$
 $-5x + y = -27 \rightarrow \textcircled{3}$
 $2x - 11 = 9 - x + 22$
 $3x + 22 = 31 \rightarrow \textcircled{4}$
 $\textcircled{1} \textcircled{4}$
 $2x - 11 = 9 - x + 22$
 $3x = 32$
 $x = \frac{32}{3}$

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$\Rightarrow \boxed{x = 6}$ $\boxed{y = 2}$
 $\boxed{z = 1}$