

19-9-2019

பகுதி - I

Marks: 100

1. d கிடைப்பு சரி
2. c  $P \times Q$
3. b 5
4. b  $(y + 7y)^2$
5. c 0
6. a 1
7. b  $\frac{1}{27}$
8. b சிவம் சாண்கள்
9. b  $70^\circ$
10. a 1.4 சத.ப
11. b 25 ச.ச
12. c  $45^\circ$
13. d  $\cot \theta$
14. a 0

19.  $\frac{(x+4)(x-4)}{(x+4)^2} = \frac{x-4}{x+4}$
20.  $x^2 - (-\frac{3}{2})x + (-1) = 0$   
 $2x^2 + 3x - 2 = 0$
21.  $\frac{\Delta ABC \text{ - விஸ்தரம்}}{\Delta DEF \text{ - விஸ்தரம்}} = \frac{BC^2}{EF^2}$   
 $\frac{54}{\Delta DEF \text{ - விஸ்தரம்}} = \frac{9}{16} = 96 \text{ சத.ப}^2$   
 $\Delta DEF \text{ - விஸ்தரம்} = 96 \text{ சத.ப}^2$
22.  $\frac{\cos \theta}{1 + \sin \theta} \times \frac{1 - \sin \theta}{1 - \sin \theta} = \frac{1 - \sin \theta}{\cos \theta}$   
 $= \sec \theta - \tan \theta$
23. C.V =  $\frac{\sigma}{x} \times 100$   
 $= \frac{6.5}{12.5} \times 100 = 52\%$
24.  $m = \tan 30^\circ = \frac{1}{\sqrt{3}}$
25.  $\frac{3-a}{a+2} = -\frac{1}{2}$   
 $\frac{3-a}{11} = -\frac{1}{2} \Rightarrow 2a = 17 \Rightarrow a = \frac{17}{2}$

பகுதி - II

15.  $A = \{3, 4\}$ ,  $B = \{-2, 0, 3\}$
16. (i)  $f = \{(-2, 2), (-1, 7), (0, 2), (3, 7)\}$   
(ii)  $f$  சமத்துவ குறி சரி
17.  $445 - 4 = 441$ ,  $572 - 5 = 567$   
 $567 = 441 \times 1 + 126$   
 $441 = 126 \times 3 + 63$   
 $126 = 63 \times 2 + 0$   
441 மற்றும் 572 - ஐ  $63$  லை வகுக்க
18.  $a = 16$ ,  $d = -5$ ,  $6n = -54$   
 $a + (n-1)d = -54$ ,  $n = 15$   
15<sup>th</sup> term of A.P is -54

26.  $f = \{0, 3, 8, 15, 24\}$
27.  $1+2+3+\dots+12 = \frac{12(12+1)}{2} = 78$   
 $78 \times 2 = 156$
28.  $(x-11)(x+13) = 0$   
குறியீடுகள் = 11, -13
- பகுதி - III
29.  $A \cap B = \{3\}$ ,  $B \cap D = \{3, 5\}$   
 $(A \cap C) \times (B \cap D) = \{(3, 3), (3, 5)\}$  — 0  
 $A \times B = \{(1, 2), (1, 3), (1, 5), (2, 2), (2, 3), (2, 5), (3, 2), (3, 3), (3, 5)\}$   
 $C \times D = \{(3, 1), (3, 3), (3, 5), (4, 1), (4, 3), (4, 5)\}$   
 $(A \times B) \cap (C \times D) = \{(3, 3), (3, 5)\}$  — 2

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

31.  $S_1 = \frac{n}{2} [2a + (n-1)d]$ ,  $S_2 = \frac{2n}{2} [2a + (2n-1)d]$   
 $S_3 = \frac{3n}{2} [2a + (3n-1)d]$   
 $S_2 - S_1 = \frac{n}{2} [2a + (3n-1)d]$   
 $3(S_2 - S_1) = \frac{3n}{2} [2a + (3n-1)d]$   
 $3(S_2 - S_1) = S_3$

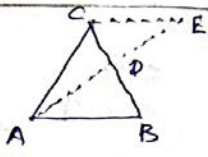
32.  $= (1^2 + 2^2 + 3^2 + \dots + 21^2) - (1^2 + 2^2 + \dots + 11^2)$   
 $= \frac{21 \times 22 \times 43}{6} - \frac{11 \times 12 \times 23}{6}$   
 $= 3311 - 55$   
 $= 3256$

33.  $f(x) = 2x(2x^3 + 7x^2 + 4x - 4)$   
 $g(x) = 3x(x^3 + 2x^2 - 4x - 8)$   
 $x^3 + 2x^2 - 4x - 8$   $\begin{array}{r} 2x^3 + 7x^2 + 4x - 4 \\ 2x^3 + 4x^2 - 8x - 16 \\ \hline 3x^2 + 4x + 4 \end{array}$

$x^2 + 4x + 4$   $\begin{array}{r} x-2 \\ x^3 + 2x^2 - 4x - 8 \\ x^3 + 4x^2 + 4x \\ \hline -2x^2 - 8x - 8 \\ -2x^2 - 8x - 8 \\ \hline 0 \end{array}$

G.C.D =  $x(x^2 + 4x + 4)$

34.  $\frac{x}{y} \begin{array}{r} x^2/y^2 - 10x/y + 27 - 10x/y + 27 \\ x^2/y^2 \\ \hline -10x/y + 27 \\ -10x/y + 27 \\ \hline 2 - 10x/y + 27 \\ 2 - 10x/y + 27 \\ \hline 0 \end{array}$

35. **கொடுப்பு:**  
**புள்ளிகள்:**  
 $\frac{AB}{AC} = \frac{BD}{CD}$   
  
 1.  $\angle AEC = \angle BAE = \angle 1$   
 2.  $\triangle ACE$  ஒரு சமக்கோண முக்கோணம்.  
 $AC = CE$   
 3.  $\triangle ABD \sim \triangle ECD$   
 $\frac{AB}{CE} = \frac{BD}{CD}$   
 4.  $\frac{AB}{AC} = \frac{BD}{CD}$

36.  $\frac{1}{2} \begin{bmatrix} -3 & a & 4 & -3 \\ 9 & b & -5 & 9 \end{bmatrix} = 0$   $a+b=21$   
 $b = 21 - a$   
 $\Rightarrow -14a - 7b + 21 = 0$   
 $\Rightarrow 2a + b - 3 = 0$   
 $2a + 1 - a - 3 = 0 \Rightarrow a = 2, b = -1$

37.  $A(1, -4), B(2, -3), C(4, -7)$   
 ABயின் சமீபம் = 1  
 BCயின் சமீபம் = -2  
 ACயின் சமீபம் = -1  
 ABயின் சமீபம்  $\times$  ACயின் சமீபம் = -1  
 $\angle A = 90^\circ$   
 $\triangle ABC$  சமக்கோண முக்கோணம்.

38. LHS :  $2(p^2 - 1)$   
 $= (\sec \theta + \tan \theta) [( \sin \theta + \cos \theta )^2 - 1]$   
 $= \frac{\sin \theta + \cos \theta}{\cos \theta \sin \theta} [1 + 2 \sin \theta \cos \theta - 1]$   
 $= 2 \sin \theta \cos \theta$   
 $= 2p$

39.  $\bar{x} = \frac{360}{8} = 45$  or  $46$   
 $\therefore \Sigma d = -8 \quad \Sigma d^2 = 172$   
 $\sigma = \sqrt{\frac{\Sigma d^2}{n} - \left(\frac{\Sigma d}{n}\right)^2} = \sqrt{\frac{172}{8} - \left(\frac{-8}{8}\right)^2}$   
 $\sigma = \sqrt{20.5} = 4.53$   
 C.V =  $\frac{4.53}{45} \times 100 = 10.07\%$

40.  $\sum x = 68$      $\sum x^2 = 690$

$$\sigma = \sqrt{\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2}$$

$$= \sqrt{\frac{690}{8} - \left(\frac{68}{8}\right)^2}$$

$$= \sqrt{86.25 - 72.25} = \sqrt{14}$$

$\sigma \approx 3.74$

41.  $x^2 - \frac{6x}{5} - \frac{2}{5} = 0$

$$x^2 - \frac{6x}{5} + \left(\frac{3}{5}\right)^2 = \frac{2}{5} + \left(\frac{3}{5}\right)^2$$

$$\left(x - \frac{3}{5}\right)^2 = \frac{19}{25}$$

$$x - \frac{3}{5} = \pm \frac{\sqrt{19}}{5}$$

$$x = \frac{3 + \sqrt{19}}{5}, \frac{3 - \sqrt{19}}{5}$$

42.  $64 = 54 \Rightarrow ar^3 = 54 \quad \text{--- (1)}$

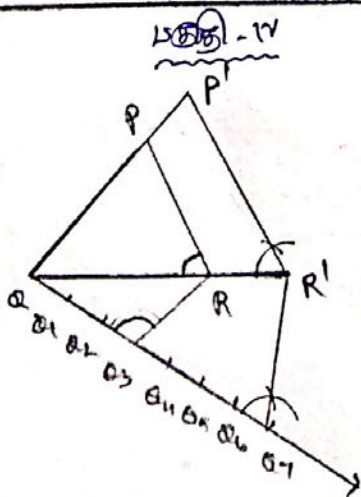
$67 = 1458 \Rightarrow ar^6 = 1458 \quad \text{--- (2)}$

$$\frac{(1)}{(2)} = \frac{ar^3}{ar^6} = \frac{1458}{54} \Rightarrow r^3 = 27$$

$r = 3$  ,  $a = 2$

$a, ar, ar^2, \dots$   
 $2, 6, 18, \dots$

43. a.



b.  $\frac{AD}{DB} = \frac{AE}{EC}$

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

$x^2 - x = x^2 - 4 \Rightarrow x = 4$

$AD = 4, DB = 2, AE = 6, EC = 3$   
 $AB = 6, AC = 9$

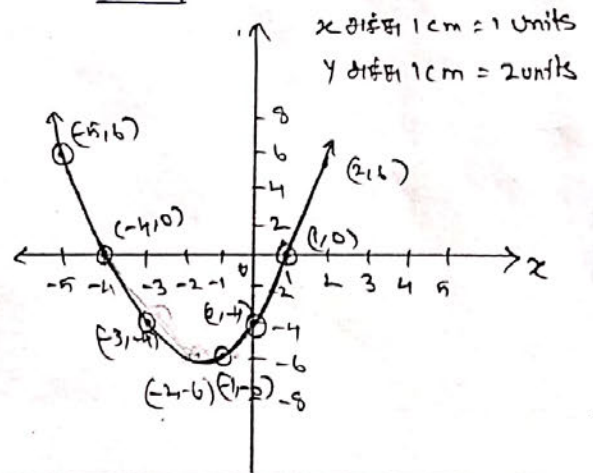
44. points:

a.  $(-5, 6) (-4, 0) (-3, 4) (-2, -6) (-1, -6)$   
 $(0, 4) (1, 0) (2, 6) (3, 14) (4, 24)$

$y = x^2 + 3x - 4$

$0 = x^2 + 3x - 4$

$x = 0$



b.  $\frac{1}{3}(x+y-5) = y-z$      $y-z = 2x-11$     --- (1)

$x-2y+3z = 5$     --- (2)

$2x-y+z = 11$     --- (3)

$2x-11 = 9 - (x+2z)$

$3x-2z = 20$     --- (4)

(1) & (2)  $\Rightarrow$

$-3x + z = -17$     --- (5)

(1) & (3)  $\Rightarrow x = -3$     --- (6)

(6) in (3)  $\Rightarrow x = 14/3$     --- (7)

(6) & (4) in (1) we get  $y = -14/3$

C. SELVAM, M.Sc, M.Ed  
 P.G.T. ASST (MATHS)  
 ST. JOSEPH'S HR-SEC. SCHOOL -  
 CHENGALPATTO