

## வெற்றிக்கு வழி / WAY TO SUCCESS

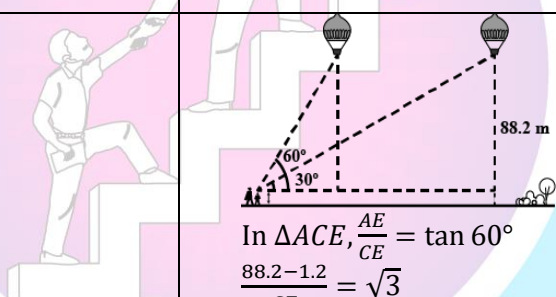
பொதுத்தேர்வு மாதிரி வினாத்தாள் விடைக்குறிப்பு / Public Model Question Paper 2020 -Answer Key  
கணக்கு / Mathematics

### PART -I / பகுதி - I

Q.No	Option	Answer	Text Book Question Number
1	(1)	(8,6)	Exercise.1.6-(8)
2	(3)	{1, -1}	Creative Question
3	(3)	7881	Exercise 2.10-(8)
4	(3)	$\frac{n(n+1)}{\sqrt{2}}$	Creative Question
5	(1)	$\frac{9y}{7}$	Exercise 3.19 - (4)
6	(2)	4	Exercise 3.19 - (15)
7	(3)	$\angle B = \angle D$	Exercise 4.5-(1)
8	(1)	$\pm 4$	Creative Question
9	(2)	$x + y = 3,$ $3x + y = 7$	Exercise 5.5-15
10	(1)	$\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$	Exercise 6.5-(7)
11	(4)	$136\pi \text{ cm}^2$	Exercise 7.5-(1)
12	(2)	$2\pi$	Creative Question
13	(2)	160900	Exercise 8.5- (4)
14	(2)	$\frac{p}{p+q+r}$	Exercise 8.5- (10)

### PART -II / பகுதி - II

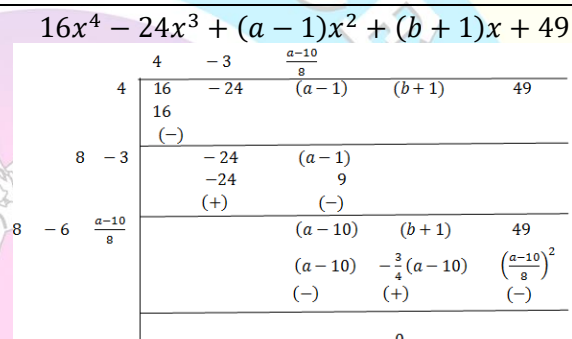
Q.No	Text Book Question Number	
15	Example 1.4	
16	Unit Exercise 2 -(6)	
17	Creative Question	<p>Given <math>1^3 + 2^3 + 3^3 + \dots + k^3 = 16900</math></p> $\left[\frac{k(k+1)}{2}\right]^2 = 16900$ $\frac{k(k+1)}{2} = \sqrt{16900}$ $1 + 2 + 3 + \dots + k = \sqrt{16900}$ $= 130$
18	Example 3.28	
19	Creative Question	$A^2 = A \cdot A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix} \cdot \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$

		$= \begin{pmatrix} 1-2 & -1-3 \\ 2+6 & -2+9 \end{pmatrix} = \begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix}$ $A^2 - 4A + 5I_2 = \begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix} - 4 \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix} + 5 \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ $= \begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix} + \begin{pmatrix} -4 & 4 \\ -8 & -12 \end{pmatrix} + \begin{pmatrix} 5 & 0 \\ 0 & 5 \end{pmatrix}$ $= \begin{pmatrix} -1-4+5 & -4+4+0 \\ 8-8+0 & 7-12+5 \end{pmatrix}$ $= \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} = 0$
20	Exercise 4.3-1	
21	Creative Question	<p>Slope of straight line <math>3x + 4y = 7</math></p> $3x + 4y - 7 = 0 \text{ is } m_1 = \frac{-a}{b} = \frac{-3}{4}$ $m_1 = m_2 = \frac{-3}{4}$ <p>Slope of straight line <math>9x + 12y - 3 = 0</math> is</p> $m_2 = \frac{-a}{b} = \frac{-9}{12} = \frac{-3}{4}$ $m_1 = m_2 = \frac{-3}{4}$ <p><math>\therefore</math> Two straight lines are parallel.</p>
22	Example 6.5	
23	Creative Question	 <p>In <math>\triangle ACE</math>, <math>\frac{AE}{CE} = \tan 60^\circ</math></p> $\frac{88.2-1.2}{CE} = \sqrt{3}$ $CE = 29\sqrt{3}$ <p>In <math>\triangle BCD</math>, <math>\frac{BG}{CG} = \tan 30^\circ</math></p> $\frac{88.2-1.2}{CG} = \frac{1}{\sqrt{3}}$ $CG = 87\sqrt{3}m$ <p>Balloon traveled distance = <math>EG = GC - EC</math></p> $= 57\sqrt{3} - 22\sqrt{3}$ $= 58\sqrt{3}m$
24	Exercise 7.1- (5)	
25	Example 7.2	
26	Creative Question	<p>Standard deviation = <math>\sqrt{6}</math></p> <p>SD of new data = <math>3 \times \sqrt{6} = 3\sqrt{6}</math></p> <p>Variance of new data = <math>(3\sqrt{6})^2</math></p> $= 9 \times 6$

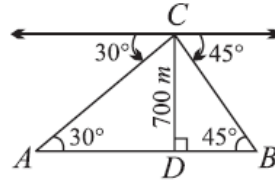
		=54
27	Exercise 8.4- (5)	
28	Creative Question	$f(x) = 3x - 2; f = \{(x, 3x - 2) / x \in R\}$ $(a, 4)$ means the image of $a$ is 4 That is, $f(a) = 4$ $3a - 2 = 4$ $3a = 4 + 2 = 6$ $a = 2.$ $(1, b)$ means the image of 1 is $b$ That is, $f(1) = b$ $3(1) - 2 = b$ $b = 1$

**PART -III / பகுதி- III**

Q.No	Text Book Question Number	
29	Exercise 1.5- 7	
30	Creative Question	$A = \{x \in W   0 < x < 5\} = \{1, 2, 3, 4\},$ $B = \{x \in W   0 \leq x \leq 2\} = \{0, 1, 2\},$ $C = \{x \in W   x < 3\} = \{0, 1, 2\}$ $B \cap C = \{0, 1, 2\} \cap \{0, 1, 2\} = \{0, 1, 2\}$ $A \times (B \cap C) = \{1, 2, 3, 4\} \times \{0, 1, 2\}$ $= \{(1, 0), (1, 1), (1, 2), (2, 0),$ $(2, 1), (2, 2), (3, 0), (3, 1), (3, 2),$ $(4, 0), (4, 1), (4, 2)\} \dots (1)$ $A \times B = \{1, 2, 3, 4\} \times \{0, 1, 2\}$ $= \{(1, 0), (1, 1), (1, 2), (2, 0), (2, 1), (2, 2),$ $(3, 0), (3, 1), (3, 2), (4, 0), (4, 1), (4, 2)\}$ $A \times C = \{1, 2, 3, 4\} \times \{0, 1, 2\}$ $= \{(1, 0), (1, 1), (1, 2), (2, 0), (2, 1), (2, 2),$ $(3, 0), (3, 1), (3, 2), (4, 0), (4, 1), (4, 2)\}$ $(A \times B) \cap (A \times C)$ $= \{(1, 0), (1, 1), (1, 2), (2, 0),$ $(2, 1), (2, 2), (3, 0), (3, 1),$ $(3, 2), (4, 0), (4, 1), (4, 2)\} \cap$ $\{(1, 0), (1, 1), (1, 2), (2, 0), (2, 1),$ $(2, 2), (3, 0), (3, 1), (3, 2),$ $(4, 0), (4, 1), (4, 2)\}$ $= \{(1, 0), (1, 1), (1, 2), (2, 0),$ $(2, 1), (2, 2), (3, 0), (3, 1),$ $(3, 2), (4, 0), (4, 1), (4, 2)\} \dots (2)$ From (1) and (2), $A \times (B \cap C) = (A \times B) \cap (A \times C)$ is verified.

31	Example 2.51	
32	Creative Question	<p>The number of saplings to be planted for each of the 25 streets in the town forms a G.P. Let <math>S_n</math> be the total number of saplings needed.</p> <p>Then, <math>S_n = 1 + 3 + 9 + \dots</math> to 25 terms.</p> <p>Here, <math>a = 1</math>, <math>r = 3</math>, <math>n = 25</math></p> $S_n = a \left[ \frac{r^n - 1}{r - 1} \right]$ $S_n = (1) \frac{[3^{25} - 1]}{3 - 1}$ $= \frac{3^{25} - 1}{2}$ <p>Thus, the number of saplings to be needed is <math>\frac{3^{25} - 1}{2}</math>.</p>
33	Creative Question	$16x^4 - 24x^3 + (a - 1)x^2 + (b + 1)x + 49$  <p>Handwritten solution for question 33:</p> $49 - \left(\frac{a-10}{8}\right)^2 = 0$ $\Rightarrow 49 = \left(\frac{a-10}{8}\right)^2$ <p>இருபுறமும் வர்க்கமூலம் எடுக்க</p> $\sqrt{49} = \sqrt{\left(\frac{a-10}{8}\right)^2}$ $\Rightarrow 7 = \frac{a-10}{8}$ $56 = a - 10$ $a = 56 + 10 = 66$ $(b + 1) + \frac{3}{4}(a - 10) = 0$ $(b + 1) = -\frac{3}{4}(a - 10) \dots (1)$ <p><math>a = 66</math> என (1)ல் பிரதியிட</p> $b + 1 = -\frac{3}{4}(66 - 10)$ $b + 1 = -\frac{3}{4}(56)$ $b + 1 = -42$ $b = -42 - 1 = -43$ $a = 66, b = -43$
34	Exercise 3.18- (2)	
35	Example 4.21	
36	Exercise 5.4- (4)	

37 Example 6.33  
38 Creative Question



$CD = 700m$ ,  $\angle CAD = 30^\circ$  and  $\angle CBD = 45^\circ$

In  $\Delta CDB$ ,

$$\tan 45^\circ = \frac{CD}{DB}$$

$$DB = CD = 700m$$

In  $\Delta CAD$ ,

$$\tan 30^\circ = \frac{CD}{AD} \Rightarrow AD = \frac{CD}{\tan 30^\circ} = \frac{700}{\frac{1}{\sqrt{3}}} = 700\sqrt{3}m$$

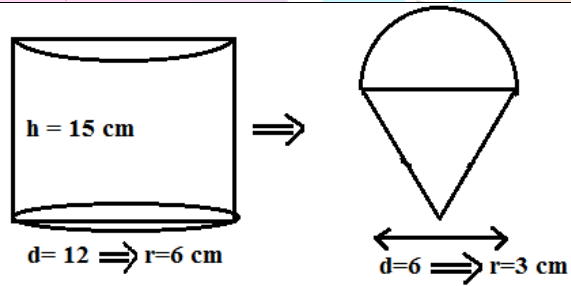
The width of the river,  $AB = AD + DB$

$$\begin{aligned} AB &= 700\sqrt{3} + 700 = 700(\sqrt{3} + 1) \\ &= 700(1.732 + 1) = 700(2.732) = \\ &1912.400 \end{aligned}$$

$$= 1912.4 \text{ m}$$

Thus, the width of the river 1912.4 m

39 Creative Question



$$\begin{aligned} \text{Volume of cylinder} &= \pi r^2 h \\ &= \pi \times 6 \times 6 \times 15 \end{aligned}$$

Volume of ice cone

= volume of cone + volume of hemisphere

$$= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$$

$$= \frac{1}{3}\pi r^2 [h + 2r]$$

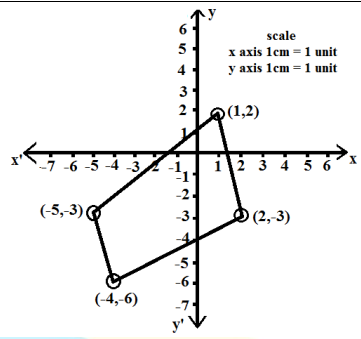
$$= \frac{1}{3} \times \pi \times 3 \times 3 \times [12 + 2(3)]$$

$$= \pi \times 3 \times 18$$

$$\text{Number of cones} = \frac{\text{volume of cylinder}}{\text{volume of ice cone}}$$

$$= \frac{\pi \times 6 \times 6 \times 15}{\pi \times 3 \times 18}$$

$$\text{Number of cones} = 10$$

40	Exercise 8.1- (11)	
41	Example 8.33	
42	Creative Question	 <p>Before determining the area of quadrilateral, plot the vertices in a graph.</p> <p>Let <math>A(-5, -3), B(-4, -6), C(2, -3), D(1, 2)</math></p> <p>Area of the quadrilateral ABCD</p> $= \frac{1}{2} \{x_1 y_2 - x_2 y_1 + x_2 y_3 - x_3 y_2 + x_3 y_4 - x_4 y_3 + x_4 y_1 - x_1 y_4\} \text{sq. units}$ $= \frac{1}{2} \{(-5)(-6) - (-4)(-3) + (-4)(-3) - (2)(-6) + (2)(2) - (1)(-3) + (1)(-3) - (-5)(2)\}$ $= \frac{1}{2} \{(30 + 12 + 4 - 3) - (12 - 12 - 3 - 10)\}$ $= \frac{1}{2} \{43 + 13\}$ $= \frac{1}{2} \{56\}$ $= 28 \text{ sq. units.}$

## PART -IV/ பகுதி- IV

Q.No	Text Book Question Number	
43a)	Exercise.3.15- 1(i)	
43b)	Exercise.3.15- 7	
44a)	Exercise 4.2-11	
44b)	Example 4.31	

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