

ALGEBRA

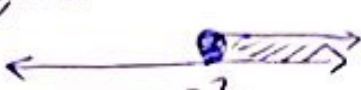
2nd prep

MODEL

ANSWER


$$\begin{aligned} \text{[1]} \quad & \sqrt{75} - \sqrt{-125} + \frac{10}{\sqrt{3}-1} \\ & 5\sqrt{3} + 5 + \frac{10}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} \\ & 5\sqrt{3} + 5 + 5\sqrt{3} + 5 \\ & = 10\sqrt{3} + 10 \end{aligned}$$

$$\begin{aligned} \text{[2]} \quad & \text{Volume} = 27\pi \\ & \pi r^2 h = 27\pi \quad \because r=h \\ \therefore & r^2 \times r = 27 \\ & r^3 = 27 \Rightarrow r = \sqrt[3]{27} \\ & r = 3 \text{ cm} \\ \text{L.S.A.} & = 2\pi r h = \\ & = 2\pi \times 3 \times 3 = 18\pi \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{[3]} \quad & 5 - 2x \leq 9 \\ & -2x \leq 9 - 5 \\ & -2x \leq 4 \quad (\div -2) \\ & x \geq -2 \end{aligned}$$


A number line with an arrow pointing to the right starting from a closed circle at -2.

$$\text{S.S.} = [-2, \infty[$$

$$\begin{aligned} \text{[4]} \quad & 3x < 2x + 4 \\ & 3x - 2x < 4 \\ & x < 4 \end{aligned}$$


A number line with an arrow pointing to the left starting from an open circle at 4.


$$\text{S.S.} =]-\infty, 4[$$

$$\text{[5]} \quad Y = \frac{1}{\sqrt{3}-2} \times \frac{\sqrt{3}+2}{\sqrt{3}+2}$$

$$Y = -\sqrt{3} - 2$$

$$\begin{aligned} X Y & = (\sqrt{3} + 2)(-\sqrt{3} - 2) \\ & = -7 - 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{[6]} \quad & \text{Area} = L^2 \\ & L^2 = 36 \Rightarrow L = \sqrt{36} \\ & \quad \quad \quad = 6 \text{ cm} \\ \text{Volume} & = L^3 = 6^3 = 216 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} \text{[7]} \quad & 1 < x + 1 \leq 4 \\ & 0 < x \leq 3 \end{aligned}$$


A number line with an arrow pointing to the right, starting from an open circle at 0 and ending at a closed circle at 3.

$$\text{S.S.} =]0, 3]$$

$$\begin{aligned} \text{[8]} \quad & 2\sqrt{5}(\sqrt{5}-2) + \sqrt{20} + 10\sqrt{\frac{1}{5}} \\ & = 10 - 4\sqrt{5} + 2\sqrt{5} + 2\sqrt{5} \\ & = 10 \end{aligned}$$

$$\begin{aligned} \text{[9]} \quad & X = \frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} \\ & X = 2 - \sqrt{3} \end{aligned}$$

$$Y = \frac{12}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 4\sqrt{3}$$

$$X^2 + Y = (2 - \sqrt{3})^2 + 4\sqrt{3}$$

$$\boxed{10} \quad \frac{3x+1}{6} < x+1 < \frac{x+4}{2} \quad (x6)$$

$$3x+1 < 6x+6 < 3x+12$$

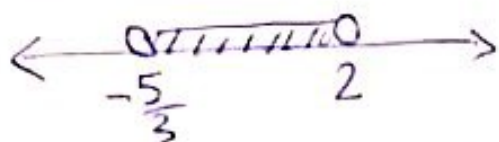
$$1 < 6x-3x+6 < 12$$

$$1 < 3x+6 < 12$$

$$1-6 < 3x < 12-6$$

$$-5 < 3x < 6$$

$$-\frac{5}{3} < x < 2$$



$$\boxed{11} \quad \sqrt{75} - 2\sqrt{27} + 3\sqrt{\frac{1}{3}}$$

$$5\sqrt{3} - 6\sqrt{3} + \sqrt{3} = \text{Zero}$$

$$\boxed{12} \quad \frac{y-x}{\sqrt{7}} = \frac{(\sqrt{13}+\sqrt{7}) - (\sqrt{13}-\sqrt{7})}{\sqrt{7}}$$

$$= \frac{\sqrt{13} + \sqrt{7} - \sqrt{13} + \sqrt{7}}{\sqrt{7}}$$

$$= 2$$

$$\frac{1}{3}xy = \frac{1}{3}(\sqrt{13}-\sqrt{7})(\sqrt{13}+\sqrt{7})$$

$$= \frac{1}{3}(13-7) = 2$$

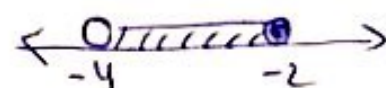
$$\therefore \frac{y-x}{\sqrt{7}} = \frac{1}{3}xy$$

$$\boxed{13} \quad 5 \leq 3-x < 7$$

$$5-3 \leq -x < 7-3$$

$$2 \leq -x < 4 \quad (\div -1)$$

$$-2 \geq x > -4$$



$$S.S =]-4, -2]$$

$$\boxed{14} \quad x+y = (\sqrt{7}+3) + (\sqrt{7}-3)$$

$$= 2\sqrt{7}$$

$$xy = (\sqrt{7}+3)(\sqrt{7}-3)$$

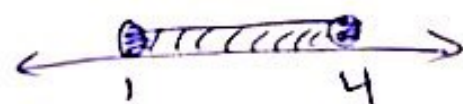
$$= -2$$

$$\left(\frac{x+y}{xy}\right)^2 = \left(\frac{2\sqrt{7}}{-2}\right)^2 = 7$$

$$\boxed{15} \quad 3 \leq x+2 \leq 6$$

$$3-2 \leq x \leq 6-2$$

$$1 \leq x \leq 4$$



$$S.S = [1, 4]$$

$$1 \in [1, 4]$$

$$\sqrt{7} \in [1, 4]$$

$$(22) \quad x = \sqrt{5} + \sqrt{2}$$

$$\frac{6}{x} + 2x = \frac{6}{\sqrt{5} + \sqrt{2}} + 2(\sqrt{5} + \sqrt{2})$$

$$= \frac{6(\sqrt{5} - \sqrt{2})}{3} + 2\sqrt{5} + 2\sqrt{2}$$

$$= 2\sqrt{5} - 2\sqrt{2} + 2\sqrt{5} + 2\sqrt{2} = 4\sqrt{5}$$

#

$$(23) \quad L.A = 2\pi rh$$

$$2\left(\frac{22}{7}\right)\left(\frac{7}{\sqrt{2}}\right)(10\sqrt{2})$$

$$= 440 \text{ cm}^2$$

$$(24) \quad x = 2\sqrt{2} - \sqrt{3} \quad y = \frac{5}{2\sqrt{2} - \sqrt{3}}$$

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

$$\therefore xy = (2\sqrt{2} - \sqrt{3})(2\sqrt{2} + \sqrt{3}) = 5 \in \mathbb{Q}$$

\(\therefore\) Then x, y are Two conjugate.

$$(25) \quad \sqrt[3]{16} - \frac{1}{3}\sqrt[3]{54} + \sqrt[3]{-2}$$

$$\sqrt[3]{8 \times 2} - \frac{1}{3}\sqrt[3]{27 \times 2} + \sqrt[3]{-1 \times 2}$$

$$2\sqrt[3]{2} - \sqrt[3]{2} - \sqrt[3]{2}$$

$$2\sqrt[3]{2} - 2\sqrt[3]{2} = 0$$

$$(17) \quad x = 2\sqrt{3} - \sqrt{2}, \quad y = \sqrt{12} + \sqrt{2}$$

$$y = 2\sqrt{3} + \sqrt{2}$$

$$\therefore x + y = 2\sqrt{3} - \sqrt{2} + 2\sqrt{3} + \sqrt{2} = 4\sqrt{3}$$

$$\begin{aligned} \therefore xy + 2 &= (2\sqrt{3} - \sqrt{2})(2\sqrt{3} + \sqrt{2}) + 2 \\ &= 12 - 4 + 2 = 10 \end{aligned}$$

$$\therefore \frac{x+y}{xy+2} = \frac{4\sqrt{3}}{10}$$

(20)

$$\frac{x}{4-\sqrt{3}} = 4 + \sqrt{3}$$

$$x = (4 + \sqrt{3})(4 - \sqrt{3})$$

$$= 16 - 3 = 13$$

(21)

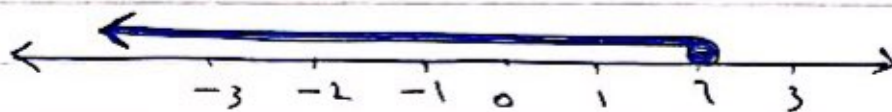
$$3 + 2x \leq 7$$

$$2x \leq 7 - 3$$

$$2x \leq 4$$

$$x \leq 2$$

$$S.S. =]-\infty, 2]$$



$$(26) \quad x = \frac{5}{\sqrt{7} - \sqrt{2}} = \frac{5(\sqrt{7} + \sqrt{2})}{5} = \sqrt{7} + \sqrt{2}$$

$$y = \frac{5}{\sqrt{7} + \sqrt{2}} = \frac{5(\sqrt{7} - \sqrt{2})}{5} = \sqrt{7} - \sqrt{2}$$

$$\begin{aligned} x^2 y^2 &= (xy)^2 = [(\sqrt{7} + \sqrt{2})(\sqrt{7} - \sqrt{2})]^2 \\ &= [7 - 2]^2 = 25 \end{aligned}$$

$$(27) \quad a - b = 2\sqrt{5} \quad \text{Then}$$

$$a(a-b)^3 \cdot b(a-b)^3 =$$

$$(a-b)^3 (a \cdot b) = (2\sqrt{5})^3 (2\sqrt{5})$$

$$= 8 \times 5\sqrt{5} \times 2\sqrt{5}$$

$$= 16 \times 5 \times 5 = 400$$

$$(28) \quad a = \sqrt{2} + 1 \quad b = \frac{1}{1 + \sqrt{2}}$$

$$b = -1 + \sqrt{2}$$

$$\text{Then } (a-b)^2 = (\sqrt{2} + 1 - (-1 + \sqrt{2}))^2$$

$$= (\sqrt{2} + 1 + 1 - \sqrt{2})^2 = 2^2 = 4$$

$$(29) \quad \text{Volume of cylinder} = \text{V. of sphere.}$$

$$\pi r^2 h = \frac{4}{3} \pi r^3$$

$$\pi (6)^2 h = \frac{4}{3} \pi (6)^3$$

$$h = \frac{4}{3} \times 6 = 8 \text{ cm.}$$

Model Answers (2nd prep. Alg.)
(School book)

First: Choose

• T. B page 139

(1) b

(5) b

(2) c

(6) c

(3) d

(7) b

(4) a

(8) d

• T. B page 140

(9) b

(15) a

(10) a

(16) c

(11) a

(17) c

(12) a

(18) d

(13) c

(19) c

(14) d

(20) c

• T. B page 141

(21) a

(24) c

(22) c

(25) b

(23) a

Model Answers (2nd prep. Alg.)
(school book)

Second : Complete.

→ T.B Page 141

① $]2, 5[$

② $] -2, \infty[$

③ $\{0\}$

④ $[1, -4]$

⑤ $3 + 2\sqrt{2}$

⑥ $]2, 5[$

⑦ 16

⑧ 1

⑨ $[1, \infty[$

⑩ 24

⑪ $[2, 4[$

⑫ 120

→ T.B Page 142

⑬ $\frac{4}{5}$

⑮ $]5, 14[$

⑭ 54 cm^2

⑯ $\gamma = 7$

30

$$(a, 2a)$$

$$y = x - 1$$

$$2a = a - 1$$

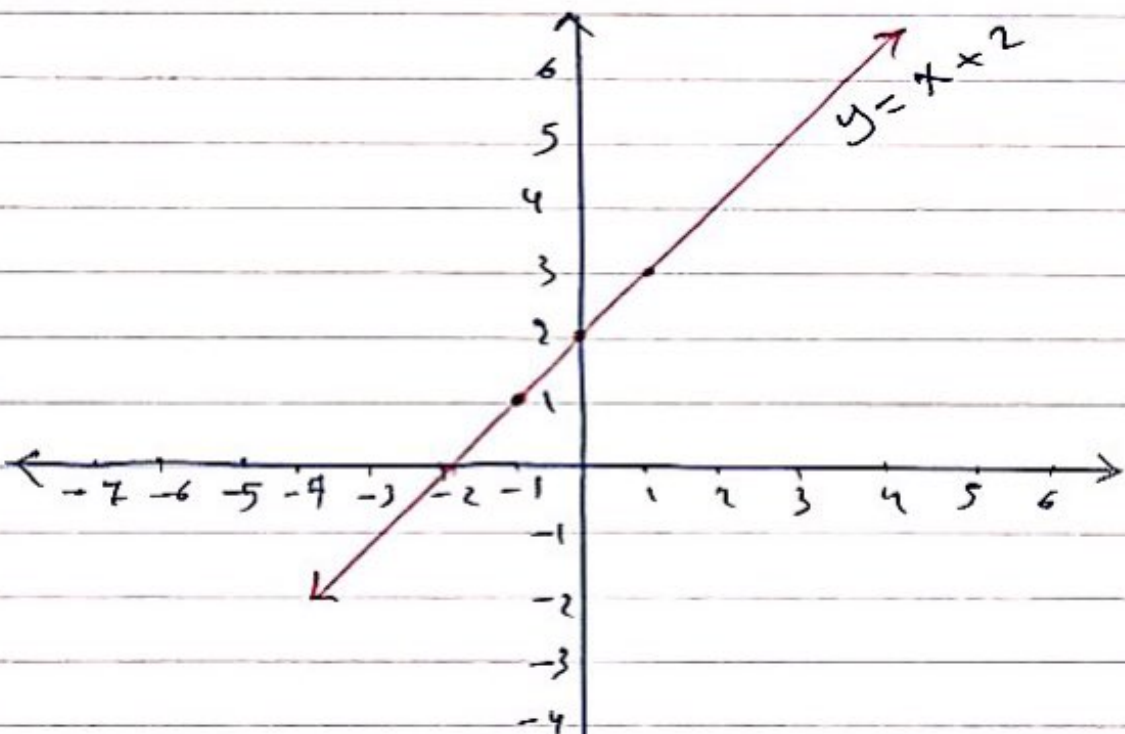
$$2a - a = -1$$

$$a = -1$$

31

$$y = x + 2$$

x	$y = x + 2$	y	(x, y)
-1	$y = -1 + 2$	1	$(-1, 1)$
0	$y = 0 + 2$	2	$(0, 2)$
1	$y = 1 + 2$	3	$(1, 3)$



(16)

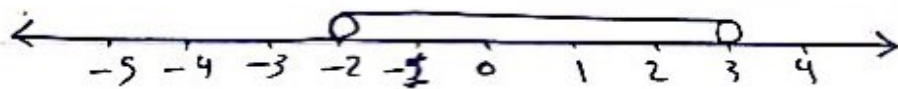
$$-1 < 5 - 2x < 7$$

$$-1 - 5 < 5 - 5 - 2x < 7 - 5$$

$$-6 < -2x < 2 \quad (\div 2)$$

$$-3 < -x < 1 \quad (\times -1)$$

$$3 > x > -2 \quad \text{S.S.} =]-2, 3[$$



(18)

Volume of cylinder = 7536 cm^3 , $h = 24 \text{ cm}$

$$\pi r^2 h = 7536$$

$$\frac{(3.14) r^2 (24)}{(3.14)(24)} = \frac{7536}{(3.14)(24)}$$

$$r^2 = 100$$

$$\therefore r = 10 \text{ cm}$$

Volume of sphere = $\frac{4}{3} \pi r^3$

$$= \frac{4}{3} (3.14) (10)^3 = 4187 \text{ cm}^3$$

(19)

$$-1 < 2x - 3 \leq 5$$

$$-1 + 3 < 2x - 3 + 3 \leq 5 + 3$$

$$2 < 2x \leq 8 \quad (\div 2)$$

$$1 < x \leq 4 \quad \text{S.S.} =]1, 4]$$

