



Studybeesofficial

Where Minds Pollinate

Class 11
Mathematics
Chapter 5
Exercise 5.3
Notes

National Book Foundation

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$$\begin{array}{r}
 2x^2 + x + 36 \\
 2x+1 \overline{) 4x^3 + 4x^2 + 73x + 36} \\
 \underline{+ 4x^3 + 2x^2} \\
 2x^2 + 73x + 36 \\
 \underline{+ 2x^2 + x} \\
 72x + 36 \\
 \underline{+ 72x + 36} \\
 0
 \end{array}$$

$$2x^2 + x + 36$$

Hence $(2x+1)(2x^2+x+36)$ are factors of h .

Exercise 5.3

Q.1) let $\boxed{\text{width} = w}$

$$\text{length} = 7+w \quad V = 120 \therefore 6(\text{height}) \times \text{length}$$

$$6(\text{height}) \times \text{length} \rightarrow \text{height} = \frac{\text{length}}{6} = \boxed{\frac{7+w}{6}}$$

$$\text{Volume} = l \times w \times h$$

$$120 = (7+w)(w)\left(\frac{7+w}{6}\right)$$

$$(120 \times 6) = w(7+w)^2$$

$$720 = w(49 + w^2 + 14w)$$

$$720 = 49w + w^3 + 14w^2$$

$$P(w) = w^3 + 14w^2 + 49w - 720$$

$$\text{put } w = 5$$

$$P(5) = (5)^3 + 14(5)^2 + 49(5) - 720$$

$$P(5) = 0$$

$$\boxed{w = 5}$$

put +ve value in
calculator becu
it is not -ve.

$$l = 7 + 5 \Rightarrow \boxed{l = 12}$$

$$\frac{7+5}{2} =$$

$$h = \frac{7+5}{2} = \boxed{h = 2} \quad \boxed{w = 5}$$

Answer

Q2) $t(x) = x^3 - 12x^2 + 48x + 74$
for $\boxed{x = 12}$

$$t(12) = (12)^3 - 12(12)^2 + 48(12) + 74$$

$$t(12) = 650$$

Answer: val = $2(1+w)$

Q3) $\boxed{V = 144}$ $\boxed{w = 2h}$ $\boxed{l = 2 + w}$ $l = 2 + 2h$, height

$$\text{Volume} = l \times w \times h$$

$$144 = (2 + 2h)(2h)(h)$$

$$72 = 2(1 + h)(h)(h)$$

$$36 = (1 + h)(h)^2$$

$$36 = h^2 + h^3$$

$$p(h) = h^3 + h^2 - 36$$

$\boxed{\text{put } h = 3}$ length is never -ve

$$p(h) = (3)^3 + (3)^2 - 36$$

$$= 27 + 9 - 36$$

$$= 0$$

$$\boxed{h = 3}$$

$$w = 2(3) = \boxed{w = 6}$$

$$l = 2 + 2(3) = 8$$

$$\boxed{l = 8}$$

Ans

Q4 & $V = 2475$, $l = 3 + 2w$, $h = w - 2$
width = w

$$V = l \times w \times h$$

$$2475 = (3 + 2w)(w)(w - 2)$$

$$2475 = (3 + 2w)w^2 - 2w$$

$$2475 = 3(w^2 - 2w) + 2w(w^2 - 2w)$$

$$2475 = 3w^2 - 6w + 2w^3 - 4w^2$$

$$2475 = 2w^3 - w^2 - 6w$$

$$P(w) = 2w^3 - w^2 - 6w - 2475$$

put $w = 11$

$$P(11) = 2(11)^3 - (11)^2 - 6(11) - 2475$$

$$P(11) = 0$$

$$\Rightarrow w = 11$$

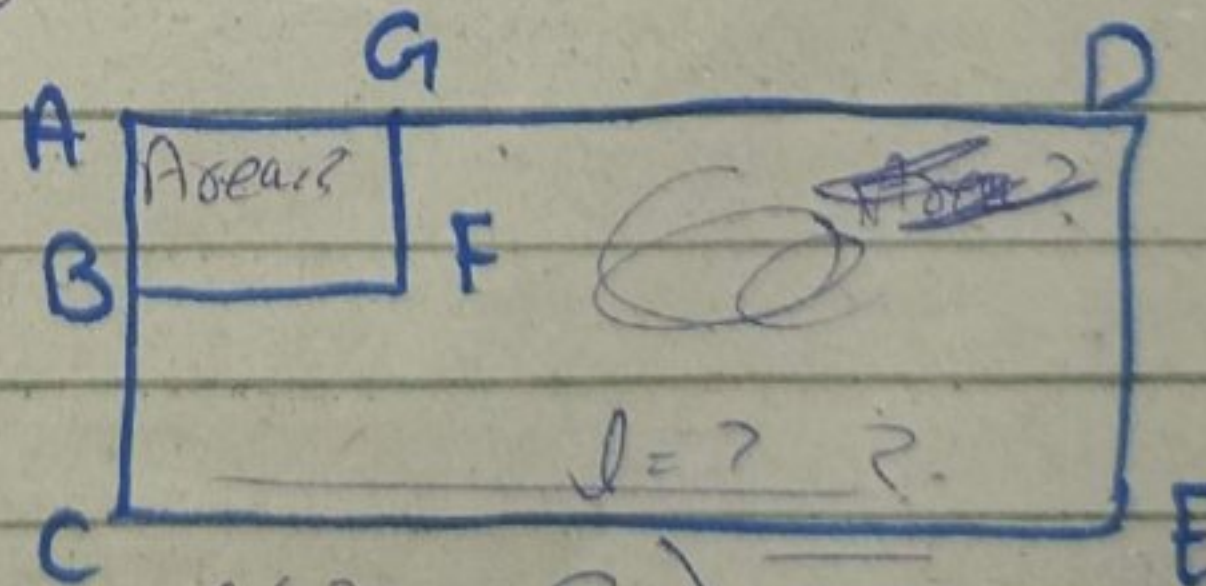
$$h = 11 - 2 \Rightarrow h = 9$$

$$l = 3 + 2(11) \Rightarrow l = 25$$

Answer

Q5 Area of rectangle ACED = $l \times w$

$$w = 2x + 8$$



$$6x^2 + 38x + 56 = l(2x + 8)$$

$$3(2x^2 + 38x + 56) = 2l(x + 4)$$

$$3x^2 + 12x + 7x + 28 = l(x + 4)$$

$$3x(x + 4) + 7(x + 4) = l(x + 4)$$

$$(x + 4)(3x + 7) = l$$

$$x + 4$$

$$l = 3x + 7$$

$$AC = \text{width} = 2x + 8$$

$$AB = \frac{AC}{2} = \frac{2(x+4)}{2}$$

$$AB = x + 4$$

Squares have all sides equal.

$$\text{Area of ABEG} = l \times w$$

$$\text{Area} = (x+4)(x+4)$$

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

Q6) volume = $y^3 - 2y^2 - y + 2 \Rightarrow l = y - 2$

$$\begin{array}{r|l} (y-2) & y^3 - 2y^2 - y + 2 \\ & \underline{+ y^3 - 2y^2} \\ & -y + 2 \\ & \underline{+ y - 2} \\ & 0 \end{array}$$

$$y^2 - 1$$

$$(y-1)(y+1)$$

Now length of two sides are

$$(y-1)(y+1)$$