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MATRIC: 18/ENG07/003

DEPT: PETROLEUM ENGINEERING

Course:

① first section

$$s = 0.5t^2, v = \frac{ds}{dt}; v = \frac{3}{2}t$$

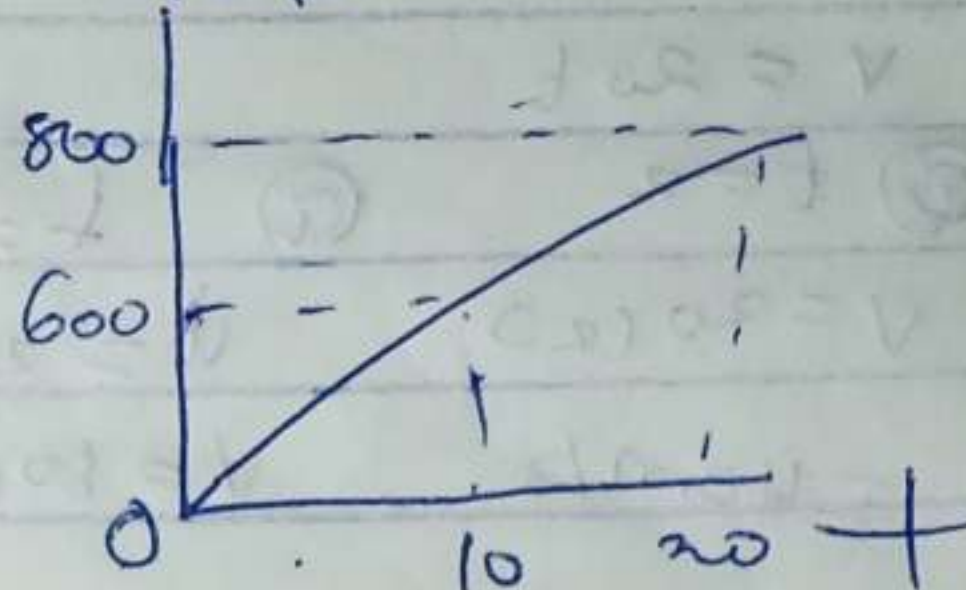
① $t=0$ ② $t=4$ ③ $t=5.9$

$$v = \frac{3}{2}t(0)^2 \quad v = \frac{3}{2}(4)^2$$

$$v = 0 \text{ m/s}$$

$$v = \frac{3}{2}(5.9)^2$$
$$v = 52.2 \text{ m/s}$$

Sketch

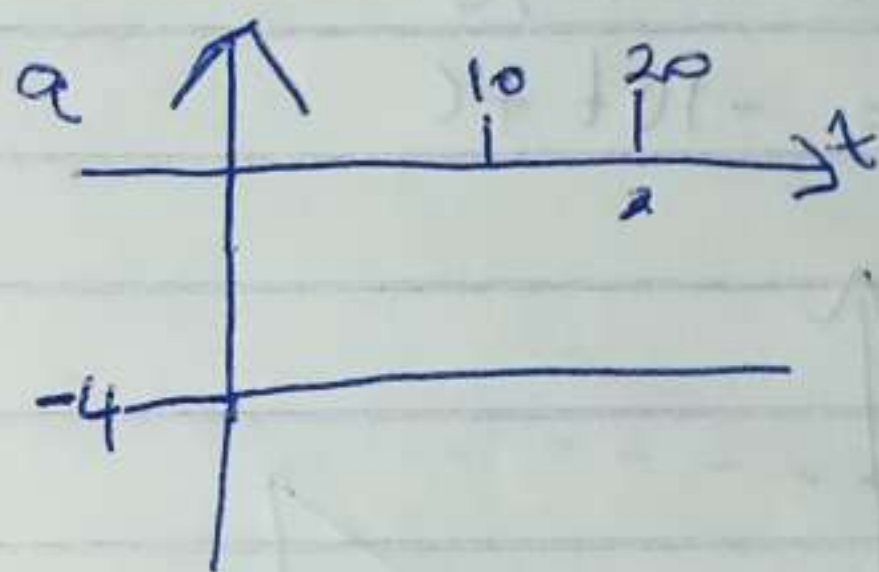
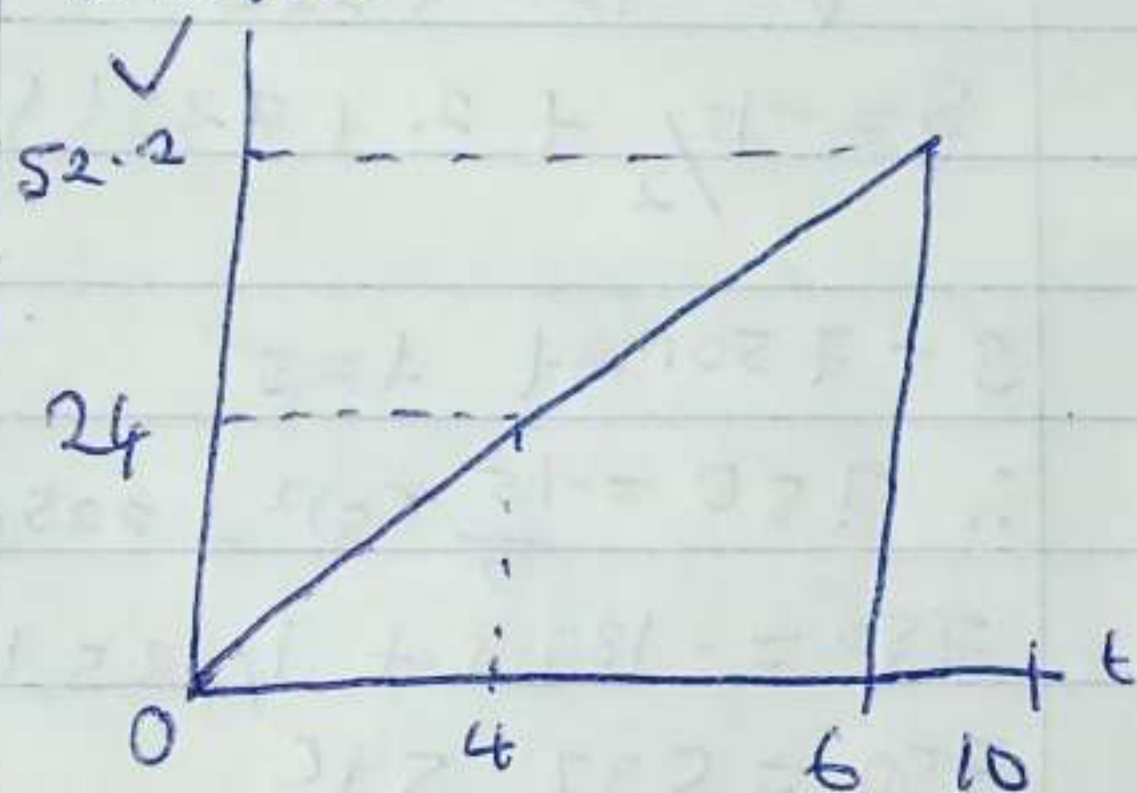


2nd section

$$s = 108 \text{ m}, v = \frac{ds}{dt}, v = 0 \text{ m/s}$$

$$a = \frac{dv}{dt} = -4 \text{ m/s}^2$$

Sketch



④ first section

$$s = 3t^2$$

① $t=0$

$$v = 0 \text{ m/s}$$

② $t=2$

$$v = 6(2) = 12 \text{ m/s}$$

$$a = 6 \text{ m/s}^2$$

③ $t=4$

$$v = 6(4) = 24$$

2nd section

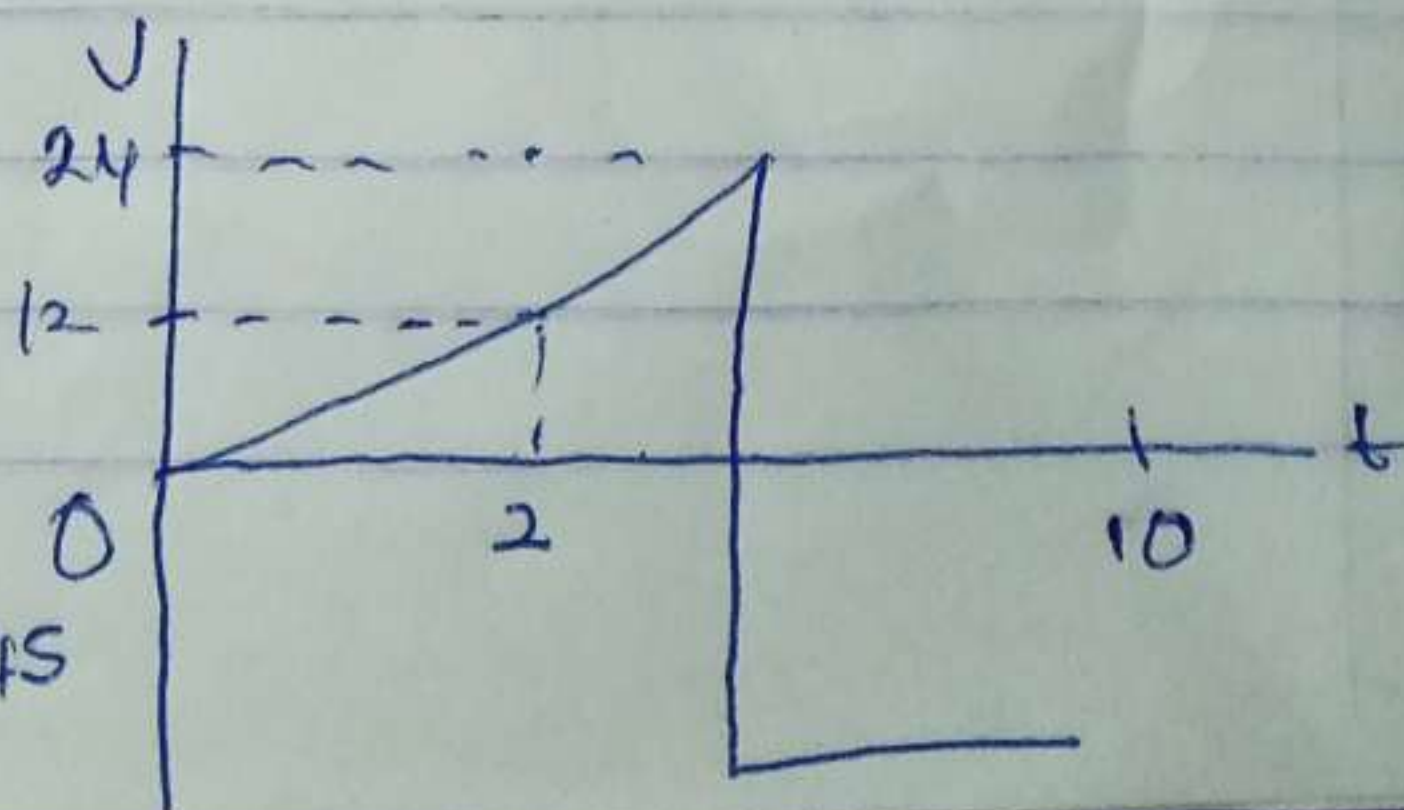
$$a = 30t - 73$$

$$v = 30t - 73$$

$$v = -45 \text{ m}^2$$

$$a = 0 \text{ m/s}^2$$

Sketch



②

$$v = -4t + 80$$

$$s = \int (-4t + 80) dt = -2t^2 + 80t$$

① $t=0$ ② $t=10$

$$s = 0$$

$$s = \frac{4(10)^2 + 80(10)}{2}$$

$$s = -200 + 800$$

$$s = 600 \text{ m}$$

③ $t=20$

$$s = \frac{-4(20)^2 + 80(20)}{2}$$

$$s = 800 + 1600$$

$$s = 800 \text{ m}$$

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1st section

$$a = 20 \text{ m/s}^2$$

$$v = \int 20 \cdot 20t + c$$

The vehicle starts from rest @ $t=0$

$$\therefore v=0; 0 = 20(0) + c$$

$$= c = 0 //$$

$$v = 20t$$

Ⓐ $t = 2$

$$v = 20(2)$$

$$= 40 \text{ m/s}$$

Ⓑ $t = 4$

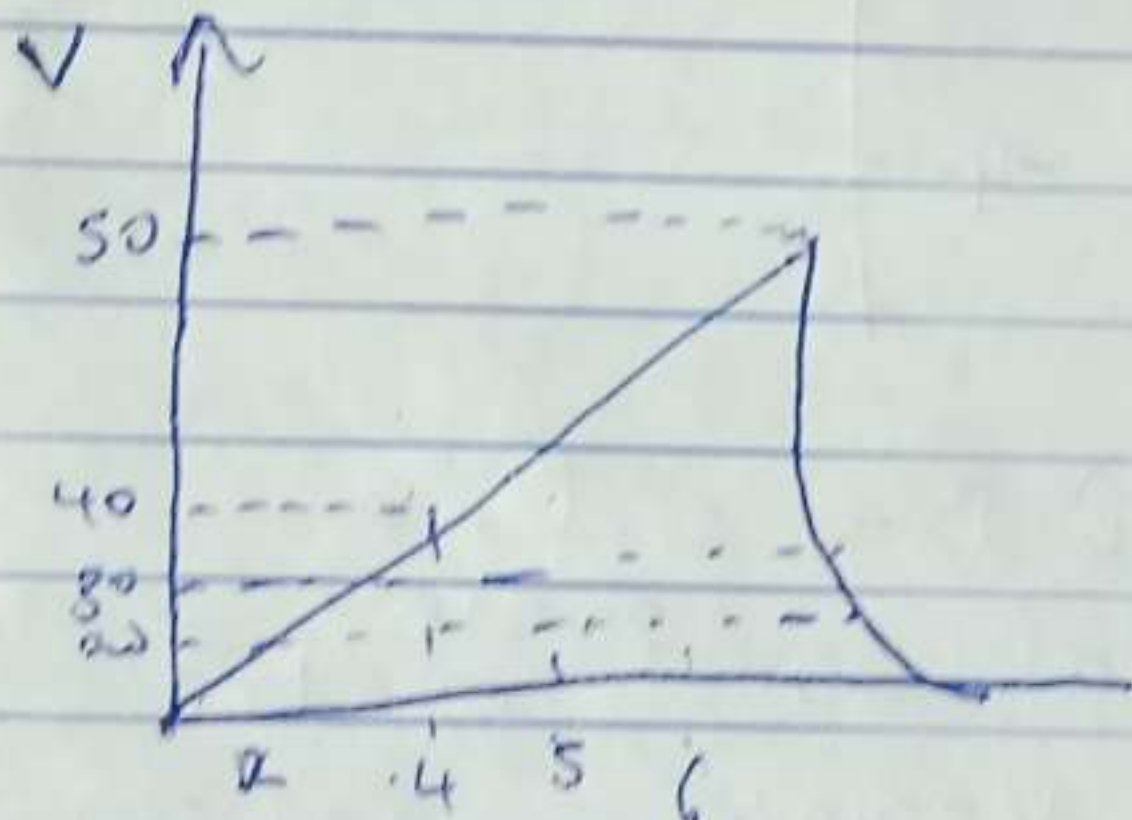
$$v = 20(4)$$

$$= 80 \text{ m/s}$$

2nd section

$$a = -10 \text{ m/s}^2$$

$$v = -10t + c$$



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1st section

$$v = 30t$$

$$s = \int 30t = 30/2 t^2 + c$$

$$at = 0; s = 0; 0 = 30/2 (0)^2 + c$$

$$\therefore c = 0$$

$$s = 30/2 (t)^2$$

Ⓐ $t = 2$ Ⓑ $t = 4$

$$s = \frac{30}{2} (2)^2 \quad s = \frac{30}{2} (4)^2$$

$$s = 240 \text{ m}$$

$$s = 60 \text{ m}$$

2nd section

$$v = -15t + 225$$

$$s = -15/2 t^2 + 225t + c$$

$$s = 750 \text{ m at } t = 5$$

$$\therefore 750 = -15/2 (5)^2 + 225(5) + c$$

$$750 = -187.5 + 1125 + c$$

$$750 = 937.5 + c$$

$$750 - 937.5 = c$$

$$c = -187.5$$

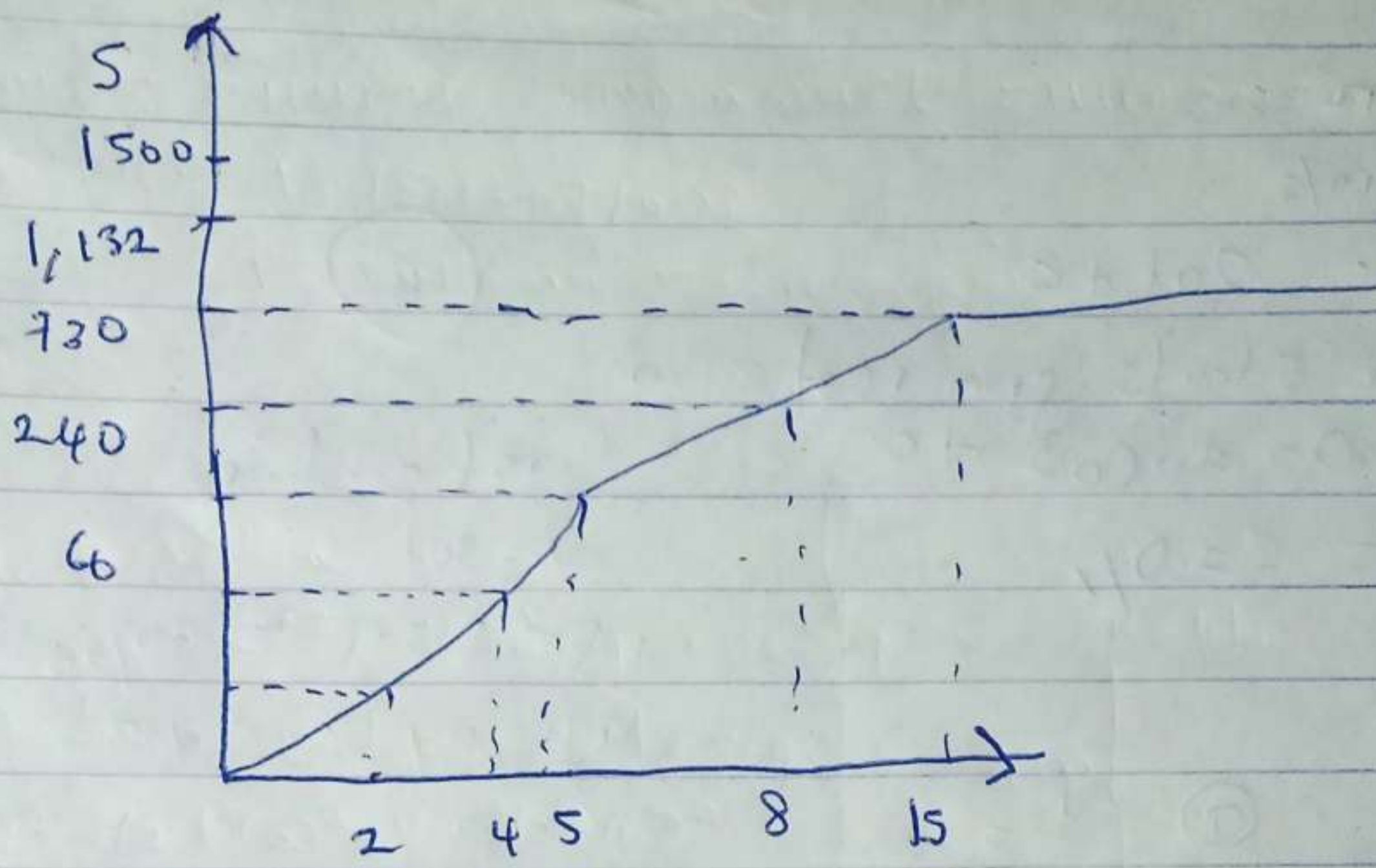
$$s = -15/2 (t)^2 + 225t - 187.5$$

Ⓐ $t = 8$

$$s = -15/2 (8)^2 + 225(8) - 187.5$$

$$s = 1182.5 \text{ m} \quad \text{Ⓑ } t = 15$$

$$s = 1500 \text{ m}$$



$$t^2 + C$$

$$30/2 (t)^2 + C$$

$$= 4$$

$$30 (4)^2$$

$$0m$$

$$+ AC$$

$$25(8) + C$$

$$+ C$$

$$- 187.5$$