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9.2

1. (a) $\frac{(40 \times 3) + (20 \times 3)}{2}$

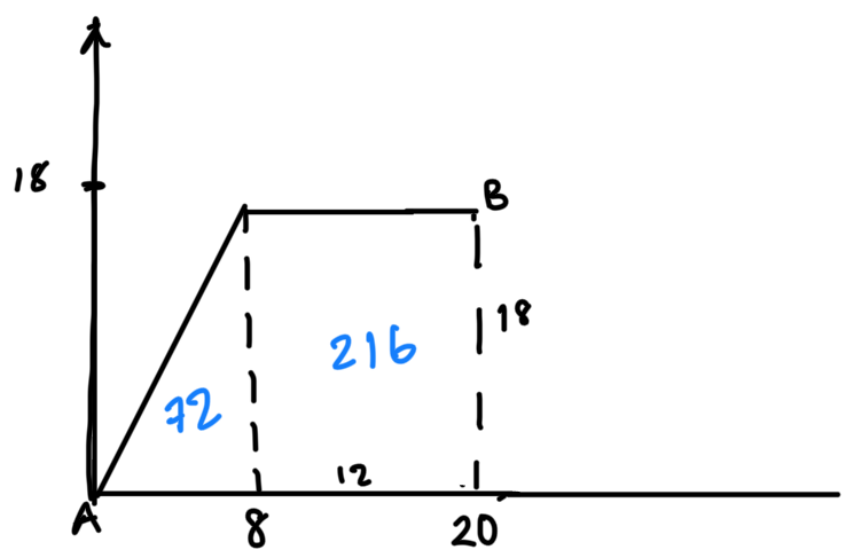
$= 120 + 30$

$= 150 \text{ km}$

(b) $\frac{3}{20} = 0.15 \text{ ms}^{-2}$

* no negative sign because the question already say "decaccelerate".

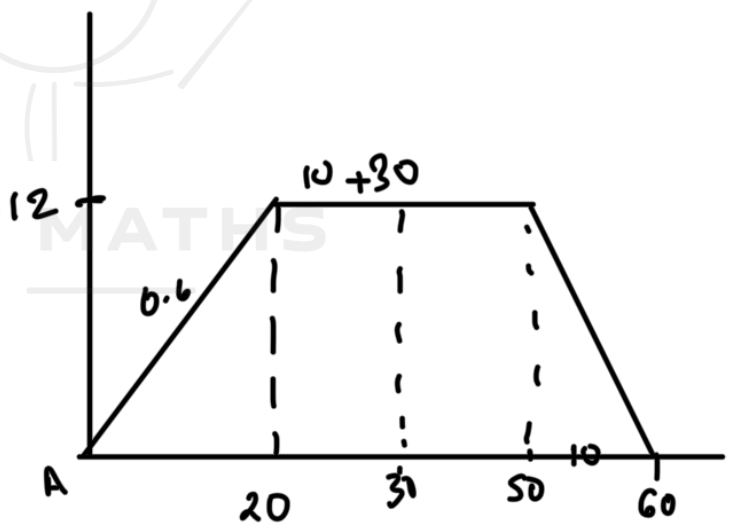
2. (a)



(b) * find the gradient of the line from A to 8 seconds. $\frac{18}{8} = \frac{9}{4} = 2.25 \text{ ms}^{-2}$

(c) $216 + 72 = 288 \text{ km/h}$

3. (a)



(b) $\frac{x}{20} = 0.6$ $\frac{12}{10} = 1.2 \text{ ms}^{-2}$

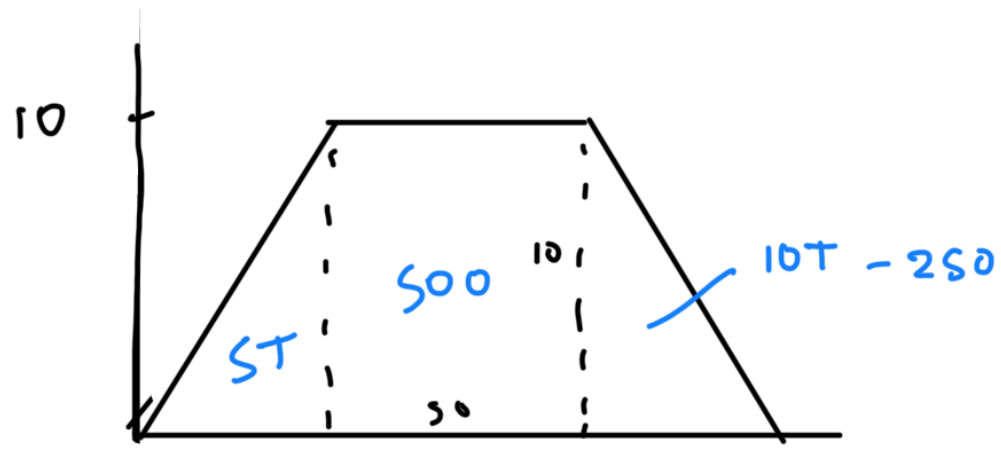
$x = 12$

(c) $\frac{1}{2}(30+60) \times 12$

$= \frac{1}{2} \times 12 \times 90 = 540$ km

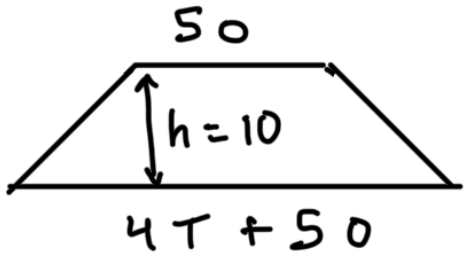
(d) $\frac{1}{2} \times 40 \times 12 = 240$ km

4. (a)



T | T+50 | T+50+3T = 4T+50

(b)



$4T + 100$

$40T + 1000$

$20T + 500 = 1000$

$20T = 500$

use area of a trapezium to find area as the area = displacement.

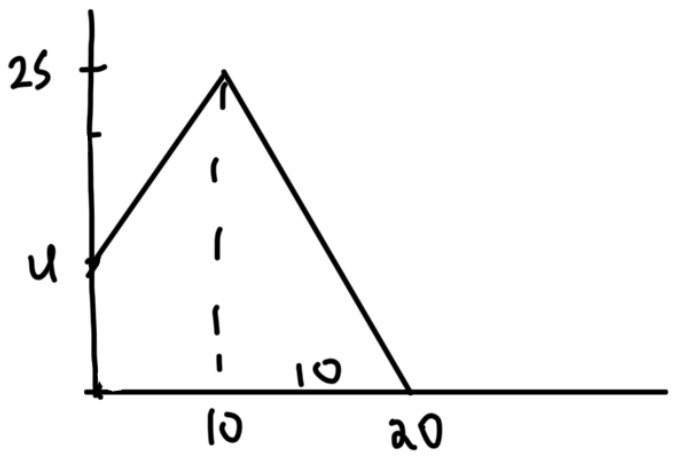
$\frac{((4T + 50) + 50)) \times h}{2}$

$= \frac{(4T + 100) \times 10}{2}$

$= \frac{40T + 1000}{2} = 20T + 500$

$$20T + 500 = 1000$$
$$20T = 1000 - 500$$
$$T = \frac{500}{20}$$
$$T = 25$$

5. (a)



(b) $(u + 25) \times \frac{1}{2} \times 10$

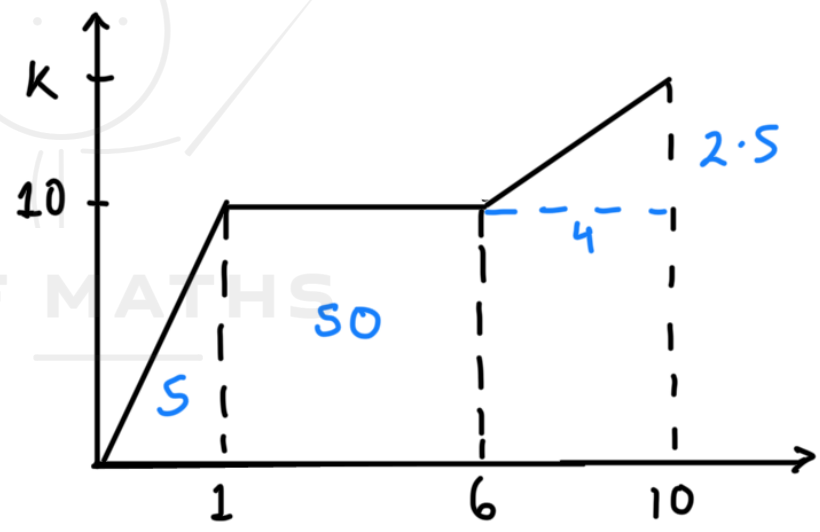
$= 5u + 125$

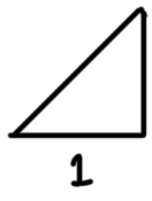
$$\frac{10 \times 25}{2} = 125$$

$$125 + 5u + 125 = 325$$

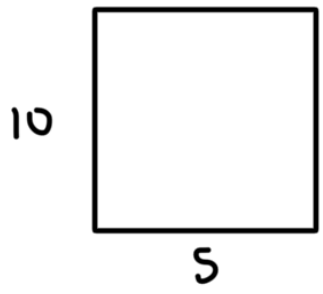
$$u = 15$$

6. (a)

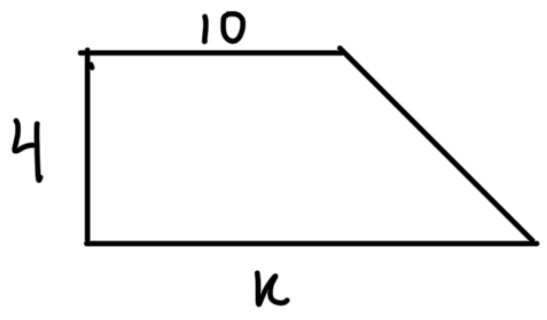


(b) 

$= \frac{1 \times 10}{2} = 5$



$= 10 \times 5 = 50$



$= \frac{(10+k)\times 4}{2} = 20 + 2k$

$5 + 50 + 20 + 2k = 100\text{ m}$
$2k = 100 - 75$
$2k = 25$
$k = 12.5$

(c) acceleration = gradient between 6 and 10 seconds.

$\frac{2.5}{4} = 0.625\ ms^{-2}$

(d) rate of acceleration decreases as velocity increases.