

(9 marks)

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$$v_A(t) = 3e^{1.5t} - 3$$

where $v_A(t)$ is measured in metres per second and t is measured in seconds for $0 \leq t \leq 2$.

(1 mark)

- (i) Show that $s_A(t) = 2e^{1.5t} - 3t - 2$. Assume that $s_A(0) = 0$.

(2 marks)

(1 mark)

The graph of $y = v_A(t)$ is shown in Figure 2.

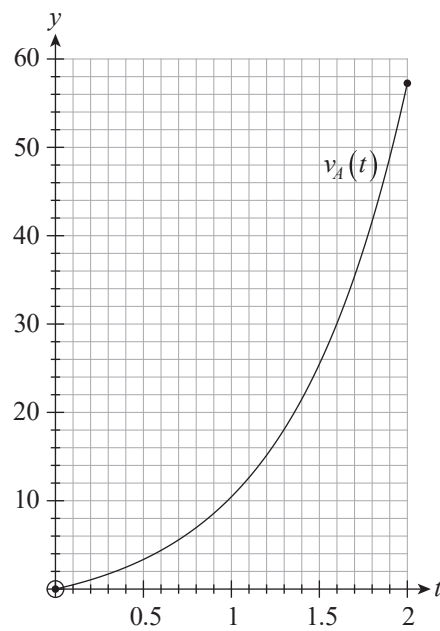


Figure 2

Car B's velocity t seconds after it is released, $v_B(t)$, can be modelled using the function

$$v_B(t) = 6.6t^2 + 8t$$

where $v_B(t)$ is measured in metres per second and t is measured in seconds for $0 \leq t \leq 2$.

- (c) On Figure 2 above, sketch the graph of $y = v_B(t)$.

(2 marks)

- (d) For what values of t was the velocity of Car A greater than the velocity of Car B?

(1 mark)

- (e) Which car, Car A or Car B, do the models suggest has travelled the furthest during the 2 seconds that they are observed? Justify your answer.

(2 marks)