## Differentiation \& Functions (Q 6, 7 \& 8, Paper 1)

## Lesson No. 11: Linear Graphs

## 2007

6 (b) A cold object is placed in a warm room.
Its temperature $C$ degrees after time $t$ minutes is shown in the following graph.

(i) After what time interval is the temperature of the object 0 degrees?
(ii) What is the rise in temperature of the object in the first 10 minutes?
(iii) The relationship between the temperature $C$ and the time $t$ is given by

$$
C=\frac{1}{2}(t+k) .
$$

Find the value of $k$.

## 2006

6 (b) The temperature, $C$, in degrees Celsius, of a liquid in an insulated container is related to time $t$, in hours, by

$$
C=86-6 t .
$$

(i) Draw the straight line graph of this relation, putting $t$ on the horizontal axis, for $0 \leq t \leq 8$.
(ii) Use your graph to estimate the temperature when $t=5.5$ hours.
(iii) Use your graph to estimate the time it takes for the temperature to fall from 80 degrees to 60 degrees.

## 1998

6 (b) The speed, $v$, in metres per second of an engine moving along a track is related to time, $t$, in seconds by

$$
v=\frac{1}{3}(2 t+5)
$$

(i) Draw the straight line graph of this relation, putting $t$ on the horizontal axis, for $0 \leq t \leq 8$.
(ii) Use your graph to estimate the speed when $t=2.5$ seconds.
(iii) Use your graph to estimate the time at which the speed reaches 6 metres per second.

## Answers

2007
6 (b) (i) 6 minutes
(ii) 5 degrees (iii) $k=-6$
20066 (b) (ii) 53 degrees
(iii) 3.3 hours
19986 (b) (ii) $3.3 \mathrm{~ms}^{-1}$
(iii) 6.5 s

