

Free-Standing Mathematics Qualification  
June 2007  
Intermediate Level



**USING ALGEBRA, FUNCTIONS AND GRAPHS 6988/2PM**  
**Unit 8**

**PRELIMINARY MATERIAL**

**DATA SHEET**

**To be issued to candidates between Wednesday 2 May  
and Wednesday 9 May 2007**

**REMINDER TO CANDIDATES**

YOU MUST **NOT** BRING THIS DATA SHEET  
WITH YOU WHEN YOU SIT THE EXAMINATION.  
A CLEAN COPY WILL BE MADE AVAILABLE.

### Walking distances

An Education Authority has a table that shows the distances from a number of housing areas to one of its local schools.

The table shows both the straight-line distances that have been calculated using a map of the district and the actual walking distances.

Housing area	A	B	C	D	E	F	G
Straight-line distance ( $s$ kilometres)	0.9	2	2.5	3	4	5	6
Walking distance ( $w$ kilometres)	1.2	2.6	3.3	4	5.1	6.6	7.7

### Earth and Mercury

Information relating to Earth and Mercury is given in the table below.

	Earth	Mercury
Mass in kilograms	$5.98 \times 10^{24}$	$3.59 \times 10^{23}$
Atmospheric pressure in newtons per square metre	$1.01 \times 10^5$	$2 \times 10^{-8}$
Distance from the Sun in kilometres	$1.5 \times 10^8$	$5.81 \times 10^7$
Diameter in kilometres	$1.3 \times 10^4$	$4.9 \times 10^3$

**Farm sale**

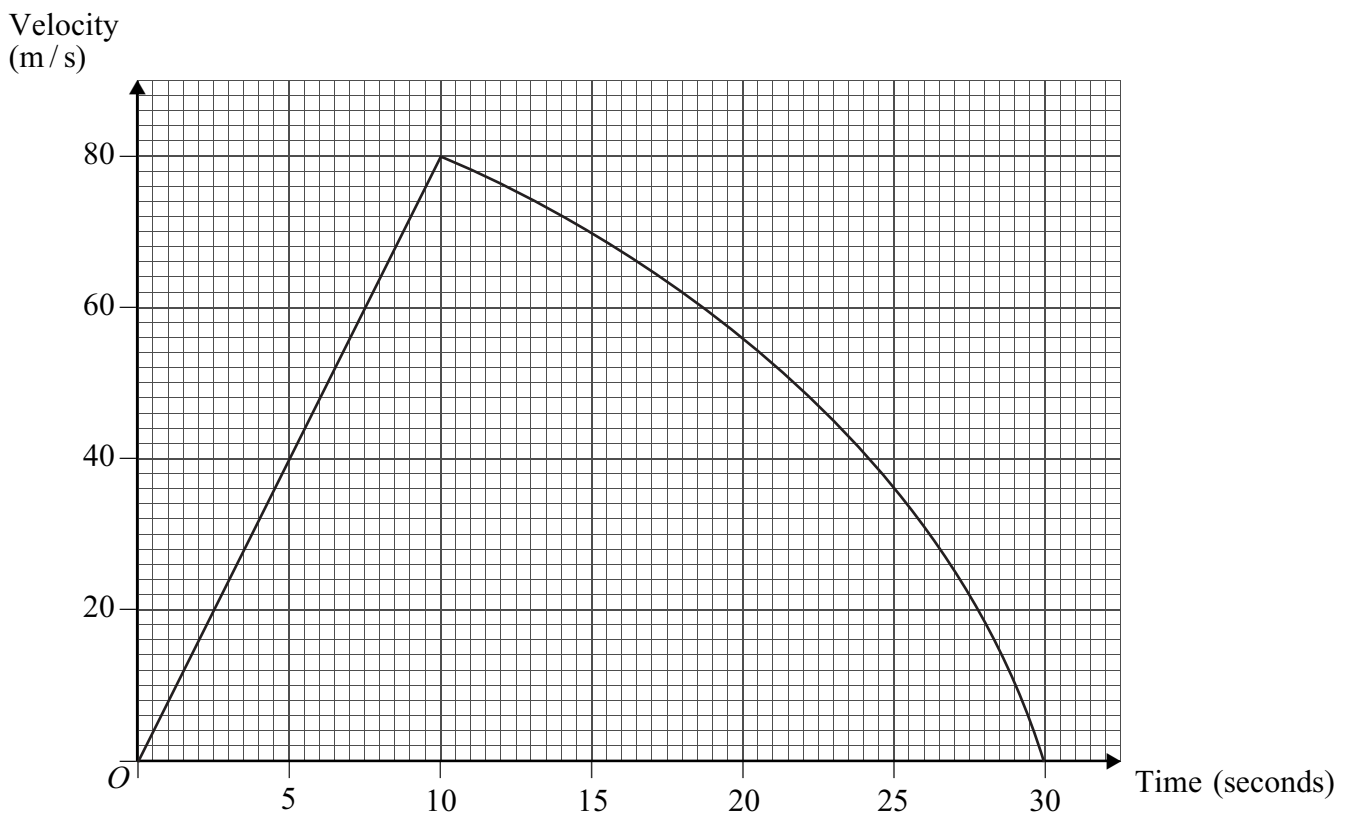
At a farm sale, a farmer can buy gates and barn doors.

For example, 6 gates and 5 barn doors cost £ 580 .

**Racing car**

The velocity–time graph for a racing car over a period of 30 seconds is shown.

The car reaches a maximum velocity of 80 metres per second.

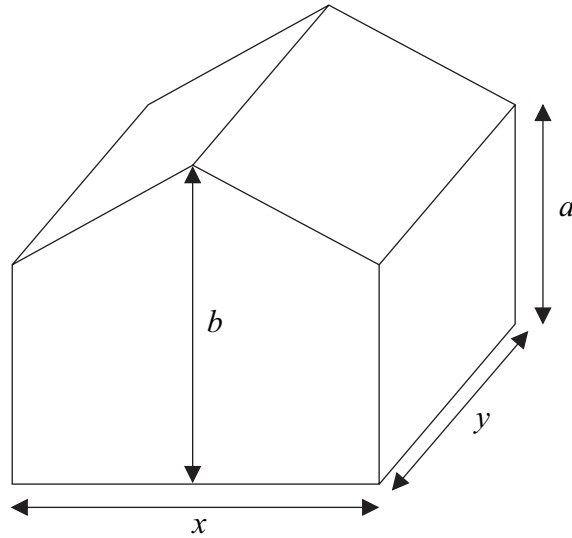


**Turn over**

**Turn over ►**

**Greenhouse**

This diagram represents a greenhouse.



The volume,  $V$ , of the greenhouse is given by the formula

$$V = \frac{1}{2}xy(a + b)$$

**Tadpoles**

A biologist records the number of tadpoles in a small pond each day.

The table below shows the results found.

<b>Day (<math>t</math>)</b>	1	2	3	4
<b>Number of tadpoles (<math>n</math>)</b>	346	478	662	916

**END OF DATA SHEET**