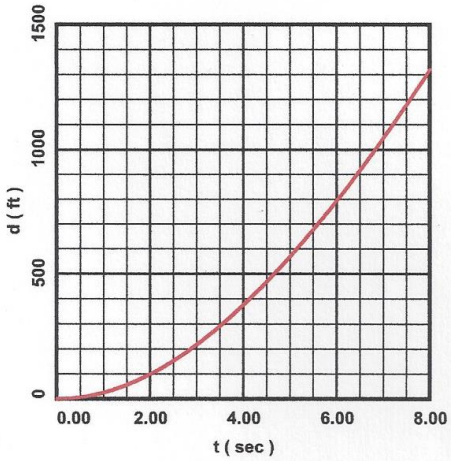
PRE–AP ALGEBRA 2

1B.2 CLASSWORK

The graph below shows the distance d, in feet, traveled by a car as a function of time t, in seconds, during an 8-second, 0.25-mile (1320 ft) drag race.



The equation of the curve is

$$d = \frac{165}{224}(36t^2 - t^3).$$

a) Using the equation, fill out the table.

t	d
0	0.000
2	100.179
4	377.143
6	795.536
8	1320.000

b) From the table, calculate the velocities

$$v = \frac{\Delta d}{\Delta t}$$

over the intervals

i) $0 \le t \le 2 \implies v(1)$
ii) $2 \le t \le 4 \implies v(3)$
iii) $4 \le t \le 6 \implies v(5)$
iv) $6 \le t \le 8 \implies v(7)$

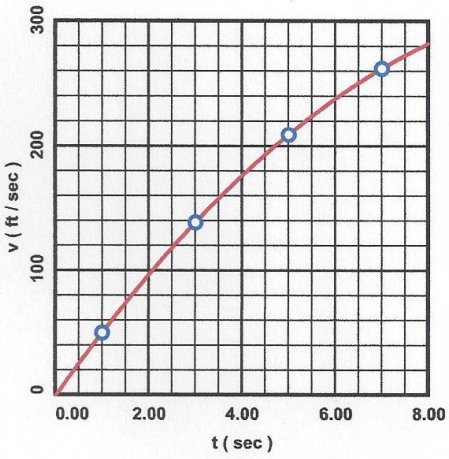
$\frac{\Delta d}{\Delta t} = \frac{100.179 - 0.000}{2-0} = 50.09$

$\frac{\Delta d}{\Delta t} = \frac{377.143 - 100.179}{4-2} = 138.48$

c) Using your results from part **b**, fill out the table.

t	v
1	50.09
3	138.48
5	209.20
7	262.23

d) Graph the points from the table in part **c** on the grid below.



e) Find the quadratic regression equation for the points in the table in part **c**. $r^2 = ?$

$v = -2.210t^2 + 53.037t - 0.738$

$r^2 = 1.000\ 000\ 00$

f) Graph the regression equation on the grid in part **d**.

$\frac{\Delta d}{\Delta t} = \frac{795.536 - 377.143}{6-4} = 209.20$

$\frac{\Delta d}{\Delta t} = \frac{1320.000 - 795.536}{8-6} = 262.23$