L6th Use of Maths. Equations
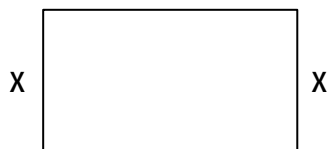
The following questions are designed to test your skills with the graphical calculator. Give non-exact answers to 3 significant figures.

(1)   Solve   a) $6.35 - 0.0625t = 2.54$

b) $2.41 (3.07x - 5.11) = 2.14x$

c) $-3.81k^2 + 0.314k + 2.40 = 0$

d) $6 - x^2 = x + 5$

e) $t(t+3) = 6t + 10$

f) $2x^4 + 7 = 102$

g) $2.31 p^3 + 3.14p^2 - 964p + 3.71 = 0$

(2) Solve   a) $3x - 4y = 10$

$2x + 7y = 3$

b) $8.40a + 4.23b = 5.31$

$-1.78a + 1.56b = -2.68$

c) $13x + 2y = 8$

$5x + 4y = 7$

(3) A rectangular sheet of plastic is required to meet 2 conditions:
It must have an area of $110cm^2$; it must have its long side 4.2 longer
Than its short side.

a)   Complete the diagram below

x ▭ x

b)   Show that $x^2 + 4.2x - 110 = 0$

c)   Find the dimensions of the sheet

(4)   A molten cup of metal is cooling. The temperature, T, (in ^{0}C)
       is given in terms of time, t, (in minutes) by the formula

$$T = 1080 - 0.062t^{2.1} \qquad \text{valid for } 0 = t = 100$$

a) State the initial temperature of the bar.
b) Find the temperature of the bar after 20 minutes.
c) Find the temperature of the bar after 1 hour.
d) How long does it take to reach a temperature of 800°C?
e) How long does it take to cool to half its original temperature?
f) Explain why the formula above cannot be true for all values of t
   (<u>hint</u> substitute a <u>large</u> value of t into the formula.)