Problem Set 1

1) $f(x) = Ax^2 + Bx - C$

$(0,-10)(2,-6)(-3,29)$

$\downarrow$

vertex

$Ax^2 + Bx - 10$

$-6 = Ax^2 + Bx - 10$

$-6 = 2(Ax + B) - 10$

$4 = 2(2A + B)$

$2 = 2A + B$

$2 = 2A + (3A - 13)$

$15 = 5A$

$\boxed{A = 3}$

$29 = -3(A(-3) + B) - 10$

$39 = -3(-3A + B)$

$-13 = -3A + B$

$B = 3A - 13$

$B = 3 \cdot 3 - 13$

$\underline{B = -4}$

Good

$\boxed{f(x) = 3x^2 - 4x - 10}$

② $ax^2+bx+c=y$

$(2,-6)\ (-3,29)$

$a(2)^2+b(2)+c=-6$

$4a+2b+c=-6$

$\quad -2b \qquad -2b$

$4a+c=-6-2b$

$\quad +6 \quad +6$

$\dfrac{4a+c+6=-2b}{-2}$

$b=-2a-\frac{1}{2}c-3$

$a(-3)^2-(2a-\frac{1}{2}c)-3+c=29$

$9a+6a+1.5c+9+c=29$

$\qquad -9 \qquad -9$

$9a+6a+1.5c+c=20$

$15a+2.5c=20$

$\quad -2.5c \quad -2.5c$

$\dfrac{15a=20-2.5c}{15}$

$a=\frac{4}{3}-\frac{1}{6}c$

$b=-2(\frac{4}{3}-\frac{1}{6}c)-\frac{1}{2}c-3$

$b=-\frac{8}{3}+\frac{1}{3}c-\frac{1}{2}c-3$

$b=-\frac{1}{6}c-\frac{17}{3}$

$(\frac{4}{3}-\frac{1}{6}c)x^2+(-\frac{1}{6}c-\frac{17}{3})+c=y$

Excellent!

There is an infinite number of 2nd degree polynomials passing through the points because c can equal any value.