

Problem Set 1

$$① f(x) = Ax^2 + Bx - C$$
$$(0, -10) (2, -6) (-3, 29)$$

↓
vertex

$$Ax^2 + Bx - 10$$

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

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

$$4 = 2(2A + B)$$

$$2 = 2A + B$$

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

$$15 = 5A$$

$$A = 3$$

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

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

$$-13 = -3A + B$$

$$B = 3A - 13$$

$$B = 3 \cdot 3 - 13$$

$$B = -4$$

$$C = 10$$

$$f(x) = 3x^2 - 4x - 10$$

Good

$$\textcircled{2} \quad ax^2 + bx + c = y$$

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

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

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

$$\begin{array}{r} -2b \quad -2b \\ 4a + c = -6 - 2b \end{array}$$

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

$$\begin{array}{r} +6 \quad +6 \\ 4a + c + 6 = -2b \end{array}$$

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

$$\begin{array}{r} -2 \\ 4a + c + 6 = -2b \end{array}$$

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

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

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

$$\begin{array}{r} -9 \quad -9 \\ 9a + 6a + 1.5c + c = 20 \end{array}$$

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

$$15a + 2.5c = 20$$

$$\begin{array}{r} -2.5c \quad -2.5c \\ 15a = 20 - 2.5c \end{array}$$

$$15a = 20 - 2.5c$$

$$\begin{array}{r} 15 \\ 15a = 20 - 2.5c \end{array}$$

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

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

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

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

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

Excellent

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