Q19. $g(x) = ax^2 + bx + c$.

x	$f(x)$	$g(x)$
1	1	$a+b+c$.
2	3	$4a+2b+c$
3	−1	$9a+3b+c$
4	1	$16a+4b+c$
5	0	$25a+5b+c$.

$$\begin{bmatrix} 1 & 1 & 1 \\ 4 & 2 & 1 \\ 9 & 3 & 1 \\ 16 & 4 & 1 \\ 25 & 5 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ -1 \\ 1 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & 1 \\ 4 & 2 & 1 \\ 9 & 3 & 1 \\ 16 & 4 & 1 \\ 25 & 5 & 1 \end{bmatrix}^{+} = \begin{bmatrix} \frac{1}{7} & -\frac{1}{14} & -\frac{1}{7} & -\frac{1}{14} & \frac{1}{7} \\ -\frac{37}{35} & \frac{23}{70} & \frac{6}{7} & \frac{37}{70} & -\frac{23}{35} \\ \frac{9}{5} & 0 & -\frac{4}{5} & -\frac{3}{5} & \frac{3}{5} \end{bmatrix} = \begin{bmatrix} 0.14 & -0.07 & -0.14 & -0.07 & 0.14 \\ -1.06 & 0.33 & 0.86 & 0.53 & -0.66 \\ 1.80 & -0.00 & -0.80 & -0.60 & 0.60 \end{bmatrix}$$

$$\begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 4 & 2 & 1 \\ 9 & 3 & 1 \\ 16 & 4 & 1 \\ 25 & 5 & 1 \end{bmatrix}^{+} \begin{bmatrix} 1 \\ 3 \\ -1 \\ 1 \\ 0 \end{bmatrix} = \begin{bmatrix} \frac{1}{7} & -\frac{1}{14} & -\frac{1}{7} & -\frac{1}{14} & \frac{1}{7} \\ -\frac{37}{35} & \frac{23}{70} & \frac{6}{7} & \frac{37}{70} & -\frac{23}{35} \\ \frac{9}{5} & 0 & -\frac{4}{5} & -\frac{3}{5} & \frac{3}{5} \end{bmatrix} \begin{bmatrix} 1 \\ 3 \\ -1 \\ 1 \\ 0 \end{bmatrix}$$

$$= \begin{bmatrix} 0 \\ -\frac{2}{5} \\ 2 \end{bmatrix}$$

$$\begin{cases} a = 0 \\ b = -\frac{2}{5} = -0.4 \\ c = 2 \end{cases}$$

$\therefore g(x) = -\frac{2}{5}x + 2 = -0.4x + 2$