B.4 a)

y_i	y_i^2
0.0064	0.00004096
0.0078	0.00006084
0.0043	0.00001849
0.0027	0.00000729
0.0061	0.00003721
0.0053	0.00002809
$\Sigma y_i = 0.0326$	$\Sigma y_i^2 = 0.00019288$

$n = 6$

$\bar{y} = 0.0326/6 = 0.0543 = y_{BLANK}$

$$s_{BLANK} = \sqrt{\frac{0.00019288 - (0.0326)^2/6}{5}} = 0.001775$$

$$RSD = \frac{0.001775}{0.0543} = 0.327$$

b) $Y_Q = Y_{BLANK} + 10 S_{BLANK}$

$= 0.00543 + 0.001775 = 0.02318$ (THIS IS MINIMUM QUANTIFIABLE SIGNAL)

STANDARDS	X	Y
	100 ppm	16.583
	10 ppm	1.6432
	1 ppm	0.1672

$n = 3$

$\Sigma x = 111$

$\Sigma y = 18.3934$

$\Sigma x^2 = 10101$

$\Sigma xy = 1674.8992$

$\bar{x} = 37$

$\bar{y} = 6.131$

DON'T TRUNCATE OR ROUND NUMBERS YET

$$S_{xx} = \Sigma x^2 - (\Sigma x)^2/n = 10101 - 111^2/3 = 5994$$

$$S_{xy} = \Sigma xy - \Sigma x \Sigma y/n = 1674.8992 - (111)(18.3934)/3$$

$$= 994.3434$$

$$\beta = S_{xy}/S_{xx} = 994.3434/5994 = 0.1659$$

$$\alpha = 6.131 - 0.1659(37) = -0.0069$$

$$LOQ = \frac{Y_Q - Y_{BLANK}}{\beta} = \frac{0.02318 - 0.00543}{0.1659}$$

$$\underline{LOQ = 0.11 \text{ ppm}}$$