_	
(b)	Taking derivative of the expression obtained in (a) wet B, and B.
1 1 1 1 1	obtailed in (a) wet B, and Be
1 11 1	and equating to 0, we get:
	B. 2. 4.2
\	1 (3)
a 1 1 1 1 1	$\beta_{1}(x,^{2}+x_{3}^{2}+\lambda)$ $\gamma_{2}(x,^{2}+x_{3}^{2})=y_{1}x_{1}+y_{2}x_{2}$
and	
	$\beta_{1}(x_{1}^{2}+x_{2}^{2}) + \beta_{2}(x_{1}^{2}+x_{2}^{2}+\lambda) = y_{1}x_{1} + y_{2}x_{2}$
	(x)
	Auto arti
	Subtracting (1) and (2) we get
	$\beta, -\beta = 0$
	or $\beta_1 = \beta_2$

(c) The lasto optimization looks like

Minimize: $(y_1 - \beta_1 x_1 - \beta_2 x_2) + (y_2 - \beta_1 x_2 - \beta_2 x_2) + \mathcal{N}(|\beta_1| + |\beta_2|)$ $x_1 = x_1 = x_1$ and $x_2 = x_2 = x_2$ we get

Minimize: $(y_1 - \beta_1 x_1 - \beta_2 x_2) + \mathcal{N}(|\beta_1| + |\beta_2|)$

The lasso constraint takes the form $[\beta_1]$ *($[k]$) \$3.7 which when plotted lake the shape of a diamond contered at origin (0,0). Next consider the squared optimization constraint $(y_1 - \beta_1 x_1 - \beta_2 x_2)^{\frac{1}{2}} + (y_2 - \beta_1 x_3 - \beta_2 x_2)^{\frac{1}{2}}$ We use the facts $x_1 = x_1 + x_2 = x_2 + x_3 + x_4 = 0$, $x_1 + x_2 = 0$ and $y_1 + y_2 = 0$ to simplify it to minimize: $2(y_1 - (\beta_1 + \beta_2)x_1)^{\frac{1}{2}}$ This optimization problem has a simple solution: [3, + \beta = \frac{1}{2} \fr	
which when plotted lake the shape of a diamond contered at origin (0,0). Next consider the squared optimization constraint (y1 & x2 - B2 x2) + (y2 - B1 x2 - B2 x22) We use the backs x1 = x2 + x2 = x2 + x2 = 0 Xx + x2 = 0 and y1 + y2 = 0 to simplify it to minimize : 2 (y - (B1 + B2) x11) This optimization problem has a simple solution: B1 + B2 = 5 Now the solution to the edge of the hast-diamond B1 + B2 = 5 Now the solution to the original lasso optimization (y - (B1 + B2) x11) that touch the lasso diamond of B1 + B2 = 5 Finally, as B1, and B2 very along the line B1 + B2 = 5 This is a parallel lasso beliamond layer B1 + B2 = 5 Action are contours of the line B1 + B2 = 5 Einally, as B2, and B2 very along the line B1 + B2 = 5 af cliff event points. As a respect, the antire adject B1 + B2 = 5 As a cliff event points. As a respect, the antire adject B1 + B2 = 5 As a cliff event points. As a respect, the antire adject B1 + B2 = 5 As a cliff event points. As a respect to the lasso optimization.	The lasso constraint takes the form (B) +(B) 53
Next consider the squared optimization constraint (y : \(\beta_1 \times_1 \) = \(\beta_2 \times_2 \) \(\beta_2	
We use the facts $x_1 = x_1, x_2 = x_3, x_4, x_5 = 0$ $x_1 + x_2 = 0$ and $y_1 + y_2 = 0$ to simplify it to minimize: $2(y_1 - (\beta_1 + \beta_2)x_{11})^2$ This optimization problem has a simple solution: $\beta_1 + \beta_2 = y_1$ This is a parallel line to the edge of the Lassidia mond $\beta_1 + \beta_2 = y_1$ Now the solution to the original lasso optimization problem are contours of the prinction $(y_1 - (\beta_1 + \beta_2)x_{11})^2$ that touch the lasso dia mond of $\beta_1 + \beta_2 = 3$ Finally, as β_1 and β_2 very along the line $\beta_1 + \beta_2 = 3$ of alignment points. As a result, the antire edge $\beta_1 + \beta_2 = 3$ is a potential solution to the lasso optimization.	
This optimization problem has a sample solution: \$\begin{align*} \begin{align*}	We use the facts $x_1 = x_2, x_2 = x_3, x_1 + x_2 = 0$, $x_1 + x_2 = 0$ to symplify it
This optimization problem has a simple solution: \[\begin{align*} align*	$\frac{10 \text{ minimise}}{2(y_1 - (\beta_1 + \beta_2) x_{11})}$
Vow the solution to the original lasto optimization problem are contours of the function (y, - (\beta_1 + \beta_2) \times_{11}) Ithat touch the lasto dia mond of \beta_1 + \beta_2 = 5 Finally, as \beta_1 and \beta_2 very along the line \beta_1 + \beta_2 = 5 these contours buch the lasso solicimonal edge \beta_1 + \beta_2 = 5 at aliferent points. As a result, the antire edge \beta_1 + \beta_2 = 5 \beta_1 + \beta_2 = 8 & \text{ a potential solution to the lasso optimization.}	This optimization problem has a sample solution:
Now the solution to the original lasso optimisation problem are contours of the punction (y, - (\beta, + \beta_s) \times,) That touch the lasso dia mond of \beta + \beta_s - s Finally, as \beta, and \beta very along the line \beta, + \beta_s - s these scentours which the lasso schemond edge \beta + \beta_s - s at cliff event points. As a result, the antire edge \beta_s + \beta_s - s \beta_s + \beta_s - s u potential solution to the lasso optimization.	diamond \(\beta\), + \(\beta\) = \(\beta\).
these contours buch the lasso solicimonal edge β + β =8 at different points. As a result, the entire edge β + β =8 β + β -8 is a potential solution to the lasso optimization.	Now the solution to the original lasso optimization problem are contours of the punction (y, - (B, + B) x,) That touch the lasso dia mond at B + B = 3
Similar argument can be made for the opposite lesso diamond edge: $\hat{\beta}$, $+\hat{\beta}^{0}$ = -8. Thus the lasso problem does not have a unique solution. The gene	Finally, as B, and B vary along the line B, +B, 8, 1/2, these Jointours which the lasso schemond edge B+B=8 at different points. As a result, the entire edge B+B=8 is a potential solution to the lasso optimization.
	Similar argument can be made for the opposite lesso diamond edge: $\hat{\beta}$, $+\hat{\beta}\hat{b}=-s$ Thus the lasso problem clossnot have a unique solution. The gene

