

Aflevering uge 4

Opgave 9.3.39

Suppose the labor cost (in dollars) for manufacturing a medical device can be approximated by

$$L(x, y) = \frac{3}{2}x^2 + y^2 - 2x - 2y - 2xy + 68$$

where x is the number of hours required by a skilled craftsman and y is the number of hours required by a semiskilled person. Find values of x and y that minimize the labor cost. Find the minimum labor cost

– s. 544

Find afledte funktioner for henholdsvis x og y

$$L_x(x, y) = 3x - 2y - 2$$

$$L_y(x, y) = 2y - 2x - 2$$

Opstil lignings system

$$\text{I: } L_x(x, y) = 0 = 3x - 2y - 2$$

$$\text{II: } L_y(x, y) = 0 = 2y - 2x - 2$$

Isoler x i II

$$0 = 2y - 2x - 2$$

$$2x = 2y - 2$$

$$x = y - 1$$

Indsæt i I

$$0 = 3x - 2y - 2$$

$$0 = 3(y - 1) - 2y - 2$$

$$0 = 3y - 3 - 2y - 2$$

$$0 = y - 5$$

$$y = 5$$

Find x

$$x = y - 1$$

$$x = 4$$

Der må derfor være et ekstremum i punktet $(4, 5)$