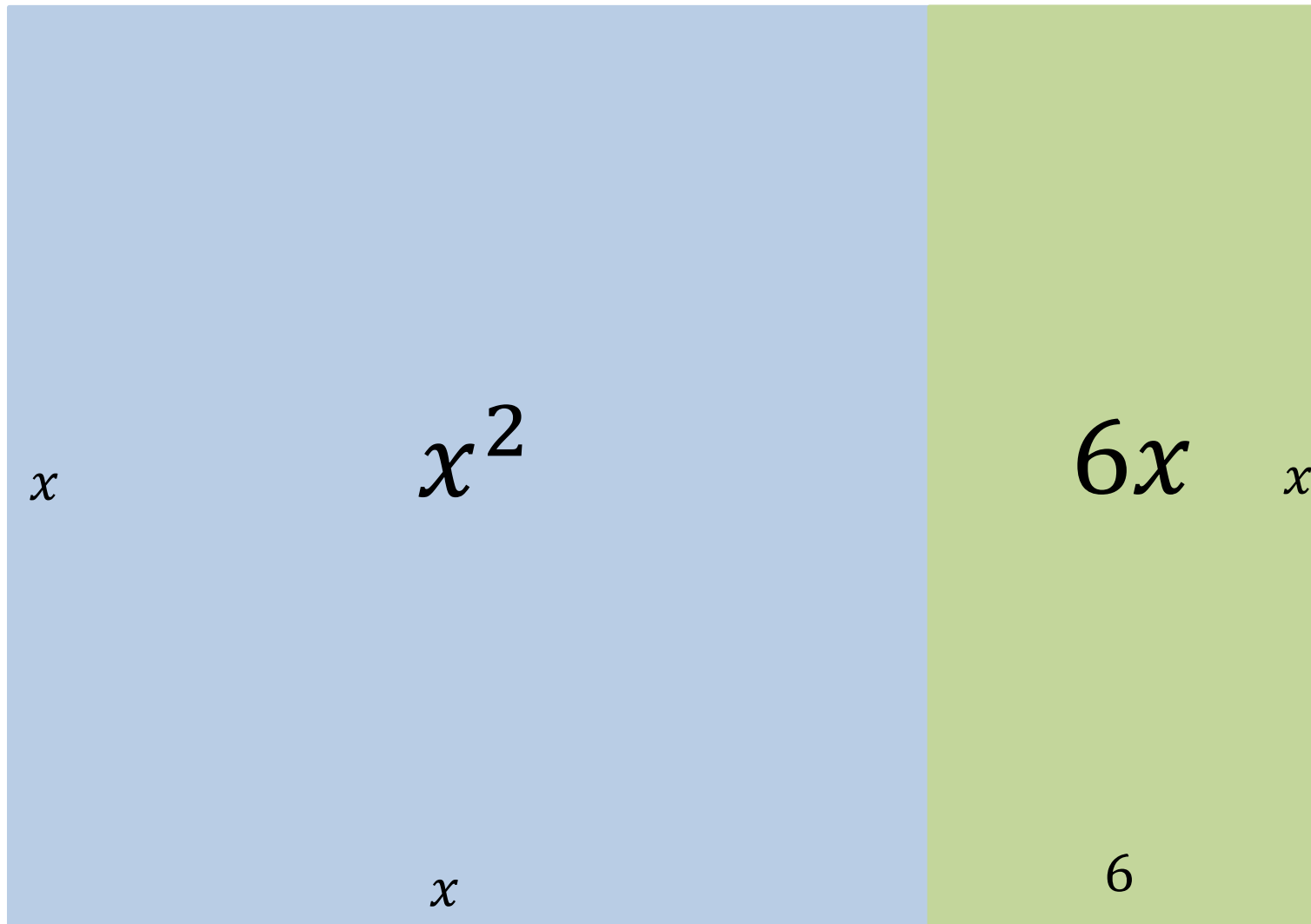
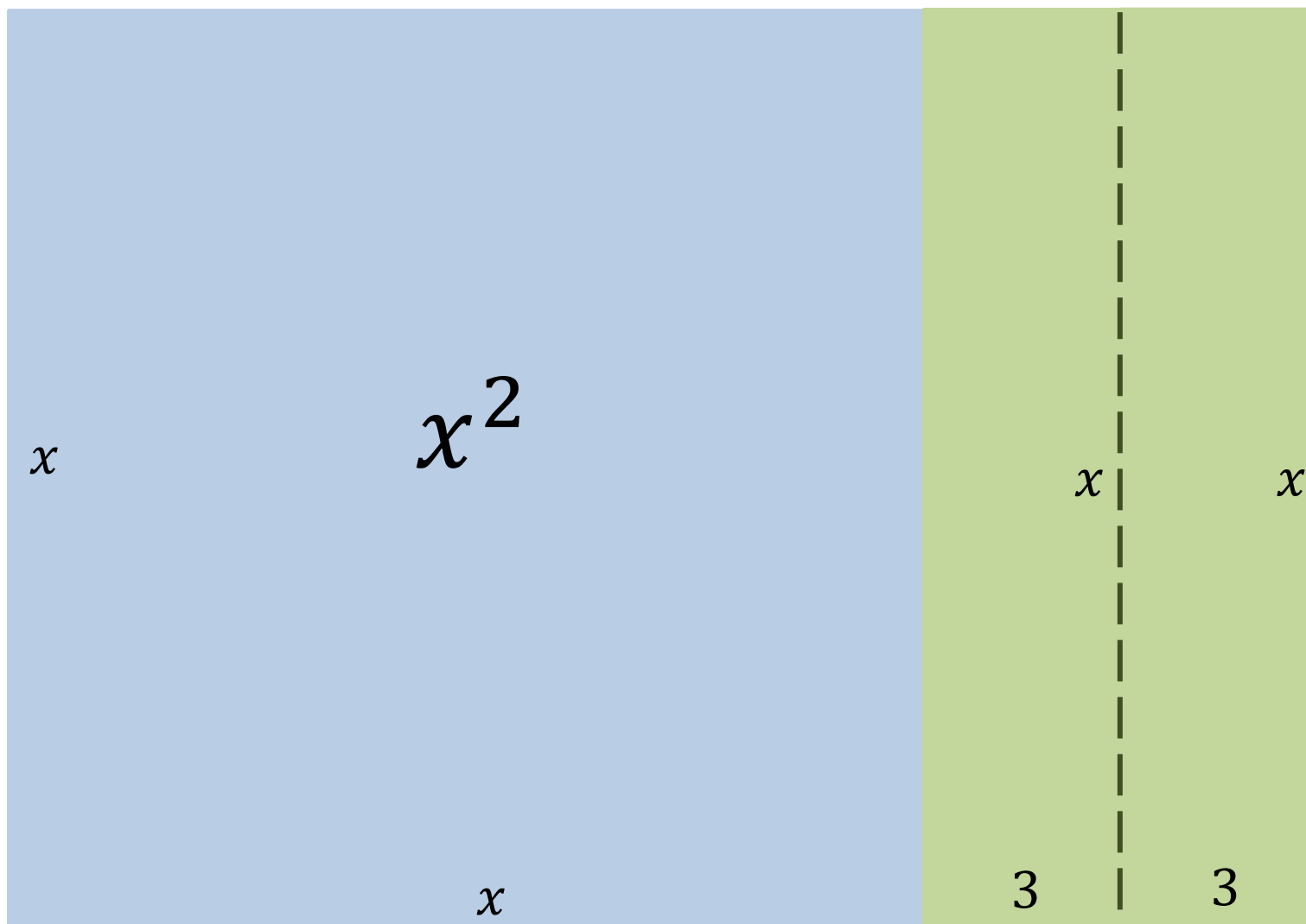


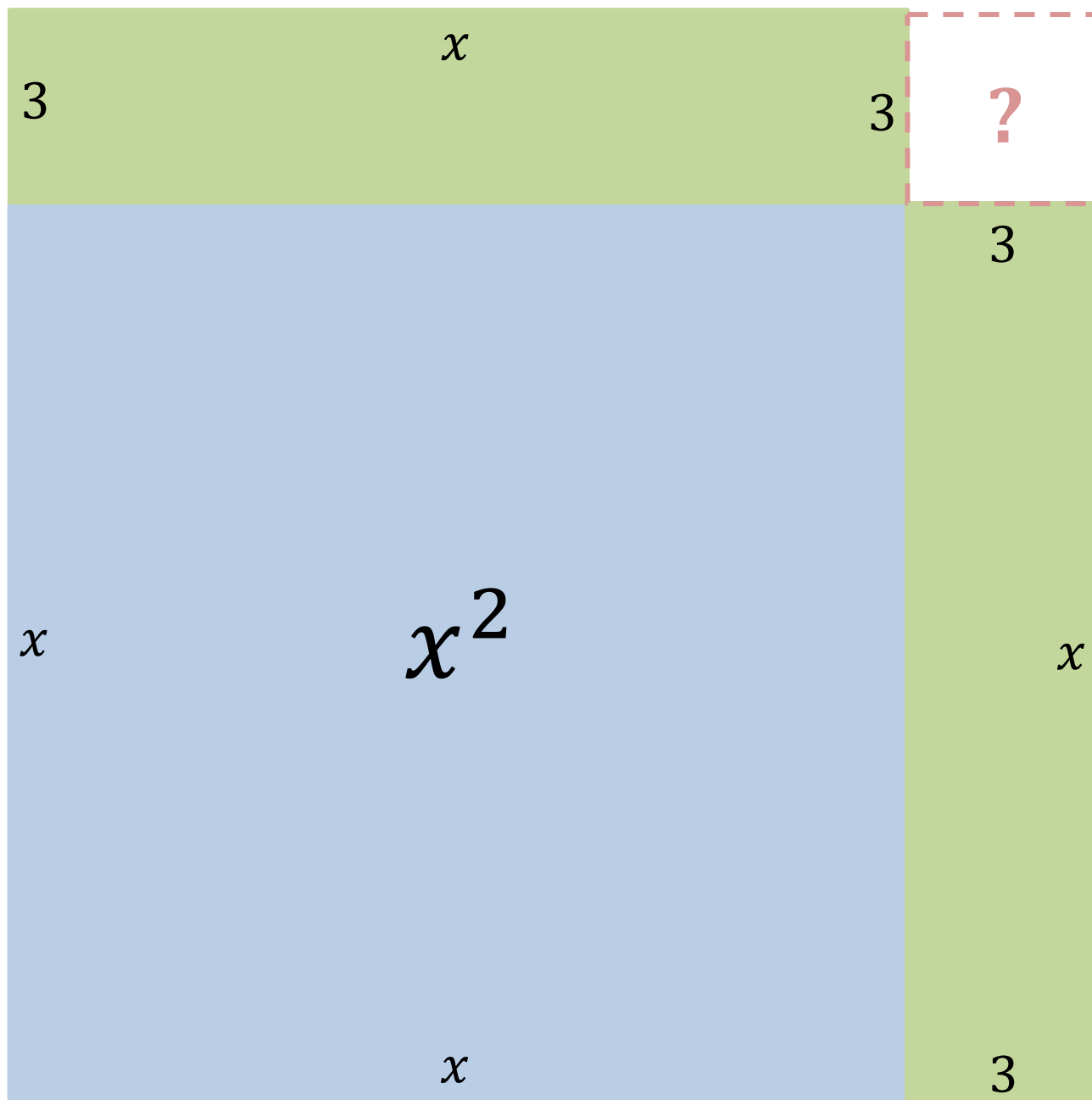
Kvadratkomplettering (geometrisk förklaring)



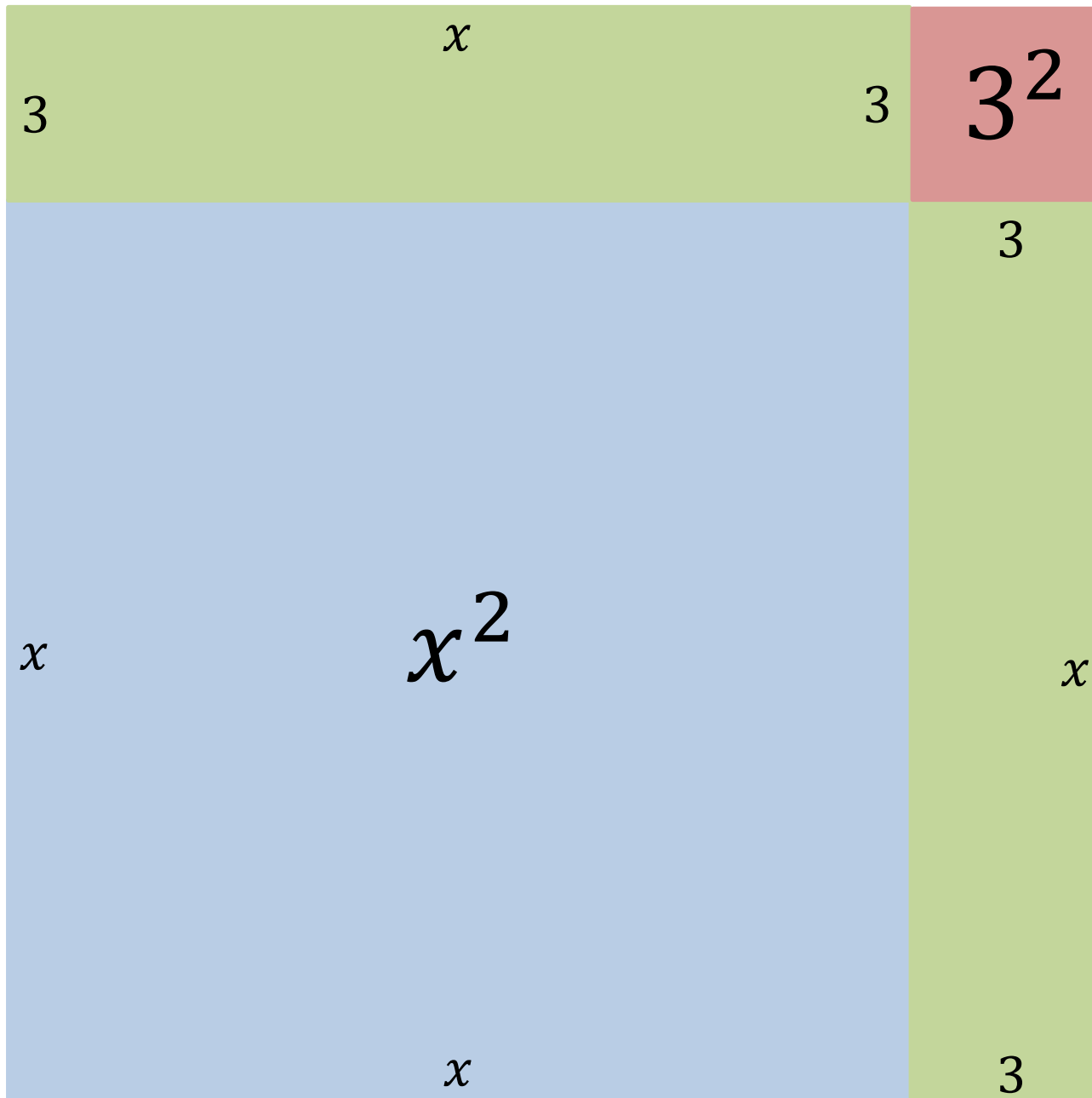
$$x^2 + 6x = 7$$



$$x^2 + 6x = 7$$



$$x^2 + 6x + \square^2 = 7 + \square^2$$



$$x^2 + 6x + 3^2 = 7 + 3^2$$

$$(x + 3)^2 = 7 + 9$$

$$(x + 3)^2 = 16$$

$$\sqrt{(x + 3)^2} = \pm\sqrt{16}$$

$$x + 3 = \pm 4$$

$$x = \pm 4 - 3 \Rightarrow \begin{cases} x_1 = 1 \\ x_2 = -7 \end{cases}$$

p-q-formel

$$x^2 + 6x - 7 = 0$$

$$x^2 + 6x = 7$$

$$x^2 + 6x + 3^2 = 3^2 + 7$$

$$(x + 3)^2 = 16$$

$$\sqrt{(x + 3)^2} = \pm\sqrt{16}$$

$$x + 3 = \pm 4$$

$$x = -3 \pm 4$$

$$x^2 + px + q = 0$$

$$x^2 + px = -q$$

$$x^2 + px + \left(\frac{p}{2}\right)^2 = \left(\frac{p}{2}\right)^2 - q$$

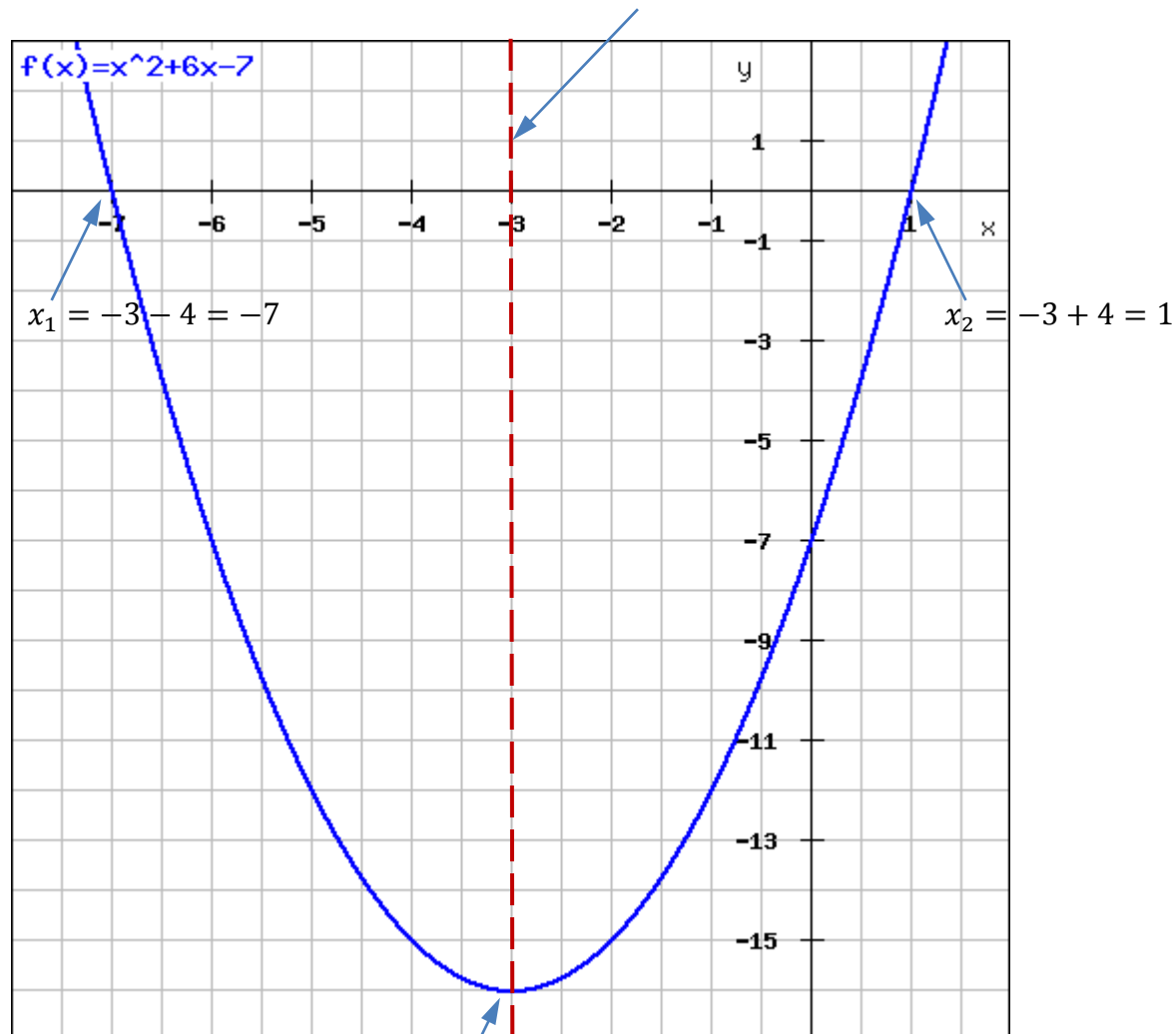
$$\left(x + \frac{p}{2}\right)^2 = \left(\frac{p}{2}\right)^2 - q$$

$$\sqrt{\left(x + \frac{p}{2}\right)^2} = \pm\sqrt{\left(\frac{p}{2}\right)^2 - q}$$

$$x + \frac{p}{2} = \pm\sqrt{\left(\frac{p}{2}\right)^2 - q}$$

$$x = -\frac{p}{2} \pm \sqrt{\left(\frac{p}{2}\right)^2 - q}$$

Symmetriaxel har ekvationen $x = -3$



Minimipunkt

$$x^2 + 6x - 7 = 0$$

$$p = 6$$

$$q = -7$$

Symmetrilinjens ekvation =

$$= -\frac{p}{2} = -\frac{6}{2} = -3$$

Minimipunktens koordinater ges av:

$$y = f(-3) = (-3)^2 + 6 \cdot (-3) - 7 = -16$$