$g(x) = x - 4\sqrt{x} + 3 \qquad D_g = \langle 0, +\infty)$

$g'(x) = 1 - 4 \cdot \frac{1}{2} x^{-\frac{1}{2}} = 1 - \frac{2}{\sqrt{x}}$

$g'(x) = 0 \iff 1 - \frac{2}{\sqrt{x}} = 0$

$1 = \frac{2}{\sqrt{x}} \quad | \cdot \sqrt{x}$

$\sqrt{x} = 2$

$x = 4$

$\searrow \quad \nearrow$

$0 \quad g' < 0 \quad 4 \quad g' > 0$

$g'(1) = -1 < 0$

$g'(9) = 1 - \frac{2}{3} > 0$

$g(4) = 4 - 4 \cdot \sqrt{4} + 3 = -1$

lokální minimum : $[4; -1]$

$g''(x) = (1 - 2x^{-\frac{1}{2}})' = (-2) \cdot (-\frac{1}{2})\, x^{-\frac{3}{2}} = \frac{1}{\sqrt{x^3}} > 0$

$\forall x \in D_g : g''(x) \neq 0 \implies$ funkce g nemá žádný inflexní bod

$g''(x) > 0 \implies g$ je ryze konvexní

průsečíky: $g(0) = 0 - 4\sqrt{0} + 3 = 3$

$P_y = [0; 3]$

$g(x) = 0 \iff x - 4\sqrt{x} + 3 = 0$

$x + 3 = 4\sqrt{x} \quad |^2$

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

$x^2 + 6x + 9 = 16x$

$x^2 - 10x + 9 = 0$

$(x-9)(x-1) = 0$

$x = 9 \lor x = 1$

$P_{x_1} = [1; 0], P_{x_2} = [1; 0]$

$$\lim_{x \to +\infty} (x - 4\sqrt{x} + 3) = \lim_{x \to +\infty} x\left(1 - \frac{4}{\sqrt{x}} + \frac{3}{x}\right) =$$

$$= \infty \cdot (1 - 0 + 0) = \underline{\underline{+\infty}}$$

x	0	1	4	9
$g(x)$	3	0	-1	0