

פונקציות שורש

$$f(x) = \sqrt{x} \quad f'(x) = \frac{1}{2\sqrt{x}}$$
$$g(x) = x-3 \quad g'(x) = 1$$

$$y = \frac{\sqrt{x}}{x-3} \quad (22)$$

$x \neq 3$
 $x \geq 0$: תחום הגדרה

$$y' = \frac{\left(\frac{1}{2\sqrt{x}} \cdot \frac{x-3}{1}\right) - 1 \cdot \sqrt{x}}{(x-3)^2}$$

$$y' = \frac{\frac{x-3}{2\sqrt{x}} - \sqrt{x}}{(x-3)^2}$$

$$y' = \frac{\frac{x-3}{2\sqrt{x}} - \frac{2\sqrt{x}\sqrt{x}}{2\sqrt{x}}}{(x-3)^2}$$

$$y' = \frac{\frac{x-3-2x}{2\sqrt{x}}}{(x-3)^2}$$

1

$$y' = \frac{-x-3}{(x-3)^2 2\sqrt{x}}$$

$$f(x) = 3\sqrt{x} \quad f'(x) = \frac{3}{2\sqrt{x}}$$

$$g(x) = x - 5 \quad g'(x) = 1$$

$$y = \frac{3\sqrt{x}}{x-5} \quad (23)$$

$x \neq 5$
 $x \geq 0$: תחום הגדרה

$$y' = 0$$

$$\frac{0}{1} = \frac{-3x - 15}{2\sqrt{x} \cdot (x-5)^2}$$

$$-3x - 15 = 0$$

$$x = -5$$

$$y' = \frac{\frac{3}{2\sqrt{3}} \cdot \frac{x-5}{1} - 1 \cdot 3\sqrt{x}}{(x-5)^2}$$

$$y' = \frac{\frac{3x-15}{2\sqrt{x}} - \frac{3\sqrt{x}}{1}}{(x-5)^2}$$

$$y' = \frac{\frac{3x-15}{2\sqrt{x}} - \frac{2\sqrt{x} \cdot 3\sqrt{x}}{2\sqrt{x}}}{(x-5)^2}$$

$$y' = \frac{\frac{3x-15-6x}{2\sqrt{x}}}{\frac{(x-5)^2}{1}}$$

$$y' = \frac{-3x-15}{2\sqrt{x} \cdot (x-5)^2}$$

$$f(x) = \sqrt{3x-5} \quad f'(x) = \frac{3}{2\sqrt{3x-5}}$$

$$y = \frac{\sqrt{3x-5}}{x+4} \quad (25)$$

$$g(x) = x+4 \quad g'(x) = 1$$

$x+4$: נקודה קריטית
 $x \geq \frac{5}{3}$

$$y' = \frac{\frac{3}{2\sqrt{3x-5}}(x+4) - \sqrt{3x-5}}{(x+4)^2}$$

$$y' = 0$$

$$-3x + 22 = 0$$

$$3x = 22$$

$$x = 7.3$$

$$y' = \frac{3x+12}{2\sqrt{3x-5}} - \frac{\sqrt{3x-5}}{1}$$

$$(x+4)^2$$

$$y' = \frac{3x+12}{2\sqrt{3x-5}} - \frac{6x-40}{2\sqrt{3x-5}}$$

$$(x+4)^2$$

$$y' = \frac{-3x+22}{2\sqrt{3x-5}(x+4)^2}$$

$$f(x) = 4x - 3 \quad f'(x) = 4$$

$$g(x) = \sqrt{2x+7} \quad g'(x) = \frac{1}{2\sqrt{2x+7}}$$

$$y = \frac{4x-3}{\sqrt{2x+7}} \quad (26)$$

$$y' = \frac{4x+31}{(2x+7)\sqrt{2x+7}}$$

$$y' = \frac{4 \cdot \sqrt{2x+7} - \frac{1}{\sqrt{2x+7}} \cdot \frac{4x-3}{1}}{(g(x))^2}$$

$$x > -3.5 : \text{מגדף פלוס}$$

$$\begin{aligned} y' &= 0 \\ 4x+31 &= 0 \\ x &= -\frac{31}{4} : \text{כש"ל} \end{aligned}$$

$$y' = \frac{4\sqrt{2x+7} - \frac{4x-3}{\sqrt{2x+7}}}{(g(x))^2}$$

$$y' = \frac{\frac{4(2x+7) - 4x+3}{\sqrt{2x+7}}}{(g(x))^2}$$

$$y' = \frac{\frac{8x+28-4x+3}{\sqrt{2x+7}}}{(g(x))^2}$$

$$y' = \frac{\frac{4x+31}{\sqrt{2x+7}}}{\frac{2x+7}{1}}$$

$$f(x) = 1 - \sqrt{x} \quad f'(x) = \frac{1}{2\sqrt{x}} \quad y = \frac{1 - \sqrt{x}}{1 + \sqrt{x}} \quad (28)$$

$$g(x) = 1 + \sqrt{x} \quad g'(x) = \frac{1}{2\sqrt{x}}$$

$$y' = \frac{-1}{\sqrt{x}(1+\sqrt{x})^2} \quad y' = \frac{\frac{1}{2\sqrt{x}} \cdot \frac{1+\sqrt{x}}{1} - \frac{1}{2\sqrt{x}} \cdot \frac{1-\sqrt{x}}{1}}{(1+\sqrt{x})^2}$$

$$y' = \frac{\frac{-1-\sqrt{x}}{2\sqrt{x}} + \frac{-1+\sqrt{x}}{2\sqrt{x}}}{(1+\sqrt{x})^2}$$

$$y' = \frac{\frac{-2}{2\sqrt{x}}}{\frac{(1+\sqrt{x})^2}{1}}$$

$$y' = \frac{\cancel{-2}}{\cancel{2}\sqrt{x}(1+\sqrt{x})^2}$$

(29)

$$f(x) = \sqrt{x^2+2} \quad f'(x) = \frac{2x}{2\sqrt{x^2+2}} = \frac{x}{\sqrt{x^2+2}} \quad y = \frac{\sqrt{x^2+2}}{\sqrt{3x-5}}$$

$$g(x) = \sqrt{3x-5} \quad g'(x) = \frac{3}{2\sqrt{3x-5}}$$

$$x > \frac{5}{3} \quad \text{: תחום הגדרה}$$

$$y' = \frac{\frac{x}{\sqrt{x^2+2}} \cdot \frac{\sqrt{3x-5}}{1} - \frac{3}{2\sqrt{3x-5}} \cdot \sqrt{x^2+2}}{(\sqrt{3x-5})^2}$$

$$y' = \frac{3x^2 - 10x - 6}{2(3x-5)\sqrt{3x-5}\sqrt{x^2+2}}$$

$$y' = \frac{x\sqrt{3x-5}}{\sqrt{x^2+2}} - \frac{3\sqrt{x^2+2}}{2\sqrt{3x-5}}$$

$$(\sqrt{3x-5})^2$$

$$0 = 3x^2 - 10x - 6$$

$$x_1 = 2.54$$

$$\cancel{x_2 = 0.78} \quad \text{! סתם}$$

$$y' = \frac{2x(3x-5) - 3(x^2+2)}{2\sqrt{3x-5}\sqrt{x^2+2}}$$

$$(\sqrt{3x-5})^2$$

$$y' = \frac{6x^2 - 10x - 3x^2 - 6}{2\sqrt{3x-5}\sqrt{x^2+2}}$$

$$3x-5$$