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יש להחליט האם להשתמש בנגזרת או בשיטת ההצבה

$$g(x) = f(x)$$

$$\frac{x^n}{2n} = \frac{1}{x^2} \rightarrow x^{n+2} = 2n \rightarrow \boxed{x = \sqrt[n+2]{2n} = 2n^{\frac{1}{n+2}}}$$

$$f'(x) = \frac{-2x}{x^4} = \frac{-2}{x^3} \quad f'(g(x)) = \frac{-2}{2n^{\frac{3}{n+2}}}$$

$$g'(x) = \frac{nx^{n+1}}{2n} = \frac{x^{n+1}}{2} = \frac{1}{2} \cdot (2n)^{\frac{n+1}{n+2}}$$

$$g'(x) \cdot f'(g(x)) = -1$$

$$-1 = \frac{-2}{(2n)^{\frac{3}{n+2}}} \cdot \frac{1}{2} (2n)^{\frac{n+1}{n+2}} = 2n^{\frac{n+1-3}{n+2}} = 2n^{\frac{n-2}{n+2}}$$

$$1 = (2n)^{\frac{n-4}{n+2}} \rightarrow \frac{n-4}{n+2} = 0 \rightarrow \boxed{n=4}$$

$$x = \sqrt[6]{8} = \sqrt[6]{2^3} = 2^{3/6} = \sqrt{2}$$

$$f'(\sqrt{2}) = \frac{-2}{8^{3/6}} = \frac{-2}{\sqrt{8^3}} = \frac{-2}{(\sqrt{2})^3} = \frac{-2}{2^{3/2}} = -2^{1-3/2} = -2^{-1/2} = -\frac{1}{\sqrt{2}}$$

$$f'(\sqrt{2}) = \frac{-2}{8^{3/6}} = \frac{-2}{\sqrt{8}} = \frac{-2}{2\sqrt{2}} = \frac{-1}{\sqrt{2}}$$

$$g'(\sqrt{2}) = \frac{1}{2} (8)^{3/6} = \frac{1}{2} \cdot \sqrt{8} = \frac{1}{2} \cdot 2\sqrt{2} = \sqrt{2}$$

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$$ax - 2\sqrt{x} = x - 1$$

האם נשתמש בנגזרת או בשיטת ההצבה

$$a - \frac{2}{\sqrt{x}} = 1$$

שיטת ההצבה או שיטת הנגזרת

$$a - \frac{1}{\sqrt{x}} = 1$$

$$a\sqrt{x} - 1 = \sqrt{x}$$

$$\sqrt{x}(a-1) = 1$$

$$\sqrt{x} = \frac{1}{a-1}$$

$$x(a-1) - 2\sqrt{x} + 1 = 0$$

$$\left(\frac{1}{a-1}\right)^2 (a-1) - 2\left(\frac{1}{a-1}\right) + 1 = 0$$

נגזרת

$$\frac{a-1}{(a-1)^2} - \frac{2}{a-1} + 1 = 0$$

$$\frac{1}{a-1} - \frac{2}{a-1} = -1 \rightarrow \frac{-1}{a-1} = -1 \rightarrow a-1 = 1 \rightarrow \boxed{a=2}$$