حل تمارين

حل تمرین

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$f(x) = x^2 + x$

$y = \sqrt{f(x) - f(\frac{4}{x})} \geq 0 \rightarrow f(x) \geq f(\frac{4}{x})$

$x^2 + x \geq (\frac{4}{x})^2 + \frac{4}{x} \rightarrow x^2 + x - \frac{4}{x} = \frac{x^3 + x^2 - 4}{x} \geq \frac{4^2}{x^2}$

$x^2(x^3 + x^2 - 4) \geq 4^2$

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$f(x^2 + x) = 2x^2 - 1 \qquad f(1) + f(2) = 8$

$x = ? \; f(\ldots) = 7 \qquad f(1) = 2 \qquad f(2) = 1$

$x = 1 \rightarrow f(2) = 1$

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$f(x) = \underbrace{x^3 - 6x^2 + 12x - 8}_{(x-2)^3} + 8 = (x-2)^3 + 8$

$g(x) = \underbrace{x^3 + 9x^2 + 27x + 27}_{(x+3)^3} - 27 = (x+3)^3 - 27$

$\frac{g(\sqrt[3]{7} - 3)}{f(\sqrt[3]{2} + 2)} = \frac{(\sqrt[3]{7} - 3 + 3)^3 - 27}{(\sqrt[3]{2} + 2 - 2)^3 + 8} = \frac{-20}{10} = -2$

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$f(x) = \sqrt{x + 4\sqrt{x - 4}} \qquad g(x) = \sqrt{x - 4\sqrt{x - 4}} \qquad x \geq 4$

$f(x) + g(x) = a + b\sqrt{x + c}$

$(f(x) + g(x))^2 = f^2(x) + g^2(x) + 2f(x)g(x) = x + 4\sqrt{x-4} + x - 4\sqrt{x-4}$

$2x + 2\sqrt{(x + 4\sqrt{x-4})(x - 4\sqrt{x-4})} = 2x + 2|x - 8| =$

$x^2 - 16(x - 4) = x^2 - 16x + 64$

$(x - 8)^2$