[9] Найти предел функции.

$$\lim_{x\to -8} \frac{\sqrt{1-x}-3}{2+\sqrt[3]{x}} = (1)$$

$$\lim_{x\to -8} \sqrt{1-x}-3 = \left(\sqrt{1-x}-3\right)_{x=-8} =$$

$$= \sqrt{1-(-8)}-3 = \sqrt{1+8}-3 = \sqrt{9}-3 = 3-3 = 0$$

$$\lim_{x\to -8} \left(2+\sqrt[3]{x}\right) = \left(2+\sqrt[3]{x}\right)_{x=-8} =$$

$$= 2+\sqrt[3]{-8} = 2+\sqrt[3]{(-2)^3} = 2+(-2) = 2-2 = 0$$

$$(1) = \left(\frac{0}{0}\right)$$

$$a^2-b^2 = (a-b)(a+b)$$

$$a^3+b^3 = (a+b)(a^2-ab+b^2)$$

$$\frac{\sqrt{1-x}-3}{2+\sqrt[3]{x}} = \frac{\left(\sqrt{1-x}-3\right)\left(\sqrt{1-x}+3\right)}{\left(2+\sqrt[3]{x}\right)\left(2^2-2\sqrt[3]{x}+\left(\sqrt[3]{x}\right)^2\right)} \cdot \frac{\left(2^2-2\sqrt[3]{x}+\left(\sqrt[3]{x}\right)^2\right)}{\sqrt{1-x}+3} = (2)$$

$$\left(\sqrt{1-x}-3\right)\left(\sqrt{1-x}+3\right) = \left(\sqrt{1-x}\right)^2-3^2 = 1-x-9 = -x-8 = -(x+8)$$

$$\left(2+\sqrt[3]{x}\right)\left(2^2-2\sqrt[3]{x}+\left(\sqrt[3]{x}\right)^2\right) = 2^3+\left(\sqrt[3]{x}\right)^3 = 8+x = x+8$$

$$(2) = \frac{-(x+8)}{x+8} \cdot \frac{4-2\sqrt[3]{x}+\left(\sqrt[3]{x}\right)^2}{\sqrt{1-x}+3} = \{x+8\neq 0;\ x\neq -8\} =$$

$$= -\frac{4-2\sqrt[3]{x}+\left(\sqrt[3]{x}\right)^2}{\sqrt{1-x}+3}$$

$$(1) = \lim_{x \to -8} -\frac{4 - 2\sqrt[3]{x} + \left(\sqrt[3]{x}\right)^2}{\sqrt{1-x} + 3} =$$

$$= \left(-\frac{4 - 2\sqrt[3]{x} + \left(\sqrt[3]{x}\right)^2}{\sqrt{1-x} + 3}\right)_{x=-8} =$$

$$= -\frac{4 - 2\sqrt[3]{-8} + \left(\sqrt[3]{-8}\right)^2}{\sqrt{1-(-8)} + 3} = -\frac{4 - 2\sqrt[3]{(-2)^3} + \left(\sqrt[3]{(-2)^3}\right)^2}{\sqrt{3^2} + 3} =$$

$$= -\frac{4 - 2(-2) + (-2)^2}{3+3} = -\frac{4+4+4}{3+3} = -\frac{12}{6} = -2$$

Ondleu:

$$\boxed{\lim_{x \to -8} \frac{\sqrt{1-x} - 3}{2 + \sqrt[3]{x}} = -2}$$