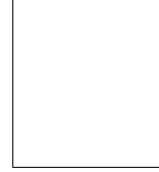




Quiz # 1
Math 101-Section 13 Calculus I
11 October 2018, Thursday
Instructor: Ali Sinan Sertöz
Solution Key



Bilkent University

Q-1)

Evaluate $\lim_{x \rightarrow 1} \frac{\sqrt{2-x} - 1}{(7+x)^{1/3} - 2}$ (10 points)

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

Solution:

$$\begin{aligned} \lim_{x \rightarrow 1} \frac{\sqrt{2-x} - 1}{(7+x)^{1/3} - 2} &= \lim_{x \rightarrow 1} \frac{\sqrt{2-x} - 1}{(7+x)^{1/3} - 2} \cdot \frac{(7+x)^{2/3} + 2(7+x)^{1/3} + 4}{(7+x)^{2/3} + 2(7+x)^{1/3} + 4} \cdot \frac{\sqrt{2-x} + 1}{\sqrt{2-x} + 1} \\ &= \lim_{x \rightarrow 1} \frac{(2-x) - 1}{(7+x) - 8} \cdot \frac{(7+x)^{2/3} + 2(7+x)^{1/3} + 4}{\sqrt{2-x} + 1} \\ &= \lim_{x \rightarrow 1} \frac{1-x}{x-1} \cdot \frac{(7+x)^{2/3} + 2(7+x)^{1/3} + 4}{\sqrt{2-x} + 1} \\ &= - \lim_{x \rightarrow 1} \frac{(7+x)^{2/3} + 2(7+x)^{1/3} + 4}{\sqrt{2-x} + 1} \\ &= - \frac{12}{2} \\ &= -6. \end{aligned}$$