Math Diversion Problem 762

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> Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time.
>
> —Thomas Edison

The material here is found at:

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Source: https://www.youtube.com/watch?v=ySvzli6KhKo
Title: Japanese || Olympiad Logarithmic Math problem |
 Presenter: Mathpoints
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1 The Problem

Given the relation

$$\log_{\sqrt{8}} x = \frac{10}{3}\,, \tag{1}$$

find the real value of x.

2 The Solution

Let's employ some lemmas about logarithms.[1]

$$\log_{\sqrt{8}} x = \frac{\log_2 x}{\log_2 \sqrt{8}} \tag{2a}$$

$$= \frac{\log_2 x}{\frac{1}{2}\log_2 8} \tag{2b}$$

$$= 2\frac{\log_2 x}{\log_2 2^3} \tag{2c}$$

$$= \frac{2}{3}\log_2 x = \frac{10}{3}\,. \tag{2d}$$

So,

$$\log_2 x = 5\,. \tag{3}$$

Thus,

$$x = 2^5 = 32\,. \tag{4}$$

[1] In WolframAlpha you can use 'Log[\sqrt{8}, x] = 10/3, solve for x', no quotes.