

Math Diversion 1021

P. Reany

January 22, 2026

Science is a community of scholars engaged in the
production of certifiable knowledge.
— W. Broad and N. Wade.
Betrayers of the Truth

Source: <https://www.youtube.com/watch?v=tsZQ3X0IVzk>
Title: Cambridge Maths Interview Question
Presenter: Math Beast

1 Problem

Given the relation

$$e^{2-2\sqrt{x}} = x, \tag{1}$$

solve for real values of x .

2 Solution

Let's begin with a little algebra:

$$e^2 = xe^{2\sqrt{x}}. \tag{2}$$

Next, we take the square root of both sides:

$$e = \sqrt{x}e^{\sqrt{x}}, \tag{3}$$

where we had to choose the positive root. On flipping the sides and taking the Lambert W function across the equation, we have that

$$\sqrt{x} = W_n(e), \tag{4}$$

where $n \in \mathbb{Z}$. When we take $n = 0$, we get that $W_0(e) = 1$, hence $x = 1$, which is the only real solution offered by WolframAlpha.