

Math Diversion Problem 629

P. Reany

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Of all the advantages that one person can have
over another, only two stand out:
Good Luck and Good Habits.
— the Author

The YouTube video is found at:

Source: <https://www.youtube.com/watch?v=CiA9PBizEkk>
Title: How to solve? | Nice Math Olympiad Question
Presenter: Math Beast

1 Problem

Given the relation

$$6^{x+2} - 6^x = 60, \tag{1}$$

find the real values of x .

2 Solution

We begin by simplifying (1):

$$36 \cdot 6^x - 6^x = 35 \cdot 6^x = 60. \tag{2}$$

Next, we divide through by 35:

$$6^x = \frac{60}{35} = \frac{12}{7}. \tag{3}$$

Now we take the natural logarithm:

$$x = \frac{\ln(12/7)}{\ln 6}. \tag{4}$$