Math Diversion Problem 737

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> Physical concepts are free creations of the human mind, and
> are not, however it may seem, uniquely determined
> by the external world.
> — Albert Einstein

The YouTube video is found at:

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Source: https://www.youtube.com/watch?v=LTIh_DcP_is
Title: KCSE QUESTION ON VARIATION
 Presenter: Mathematics by Levi
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1 The Problem

If p and q vary inversely, and if $q = 3$ when $p = 1/6$, then what is the value of p when $q = 9$?

2 The Solution

To say that p and q vary inversely is to say that there exists some constant c such that

$$pq = c\,. \tag{1}$$

But this must be true for any such pq pair. Therefore we can claim that

$$p_1 q_1 = p_2 q_2\,. \tag{2}$$

Now, since we are given p_1, q_1, q_2, we can solve this last equation for p_2:

$$p_2 = \frac{p_1 q_1}{q_2} = \frac{(1/6)(3)}{9} = \frac{1}{18}\,. \tag{3}$$