

Getting to know You Quiz

① I want to be a Software Engineer working with AI and Machine Learning

② I enjoy art, music, dancing, and reading.

③ A rational number is $\frac{p}{q}$ where p and q are both integers, and q is not equal to 0.

$$\textcircled{4} \quad \frac{a}{b} + \frac{c}{d} = \frac{ad + cb}{bd} \rightarrow \begin{array}{l} ad + cb = p \\ d + b = q \end{array}$$

since a and d are both integers, ad will also be an integer.
Likewise for cb . the sum of 2 integers, is another integer (p).

Since neither b or d are 0, $bd \neq 0 \Rightarrow q \neq 0$

Thus, the sum of 2 rational numbers is also a rational number

$$\textcircled{5} \quad \begin{array}{l} \sqrt{2} \text{ is irrational} \\ -\sqrt{2} \text{ is irrational} \end{array} \rightarrow \begin{array}{l} \sqrt{2} + (-\sqrt{2}) = \sqrt{2} - \sqrt{2} = 0 \\ 0 \text{ is rational} \end{array}$$

disproven ✓

⑥ Take primes 2, 3, and 5

$$2 * 3 * 5 = 30$$

$30 + 1$ (since 1 is not divisible by anything) = 31
which is also prime

$$\begin{aligned} \textcircled{7} \quad \text{If } \sqrt{5} &= \frac{p}{q}, \quad (\sqrt{5}q)^2 = p^2 \rightarrow p^2 = 5q^2 \\ & \frac{p^2}{5} = q^2 \\ & = \frac{p \cdot p}{5} \end{aligned}$$