Theorem: $\delta(f(x)) = \sum_i \frac{1}{|f'(x_i)|} \delta(x - x_i)$

where $x_1, \dots x_n$ let $f(x_i) = 0$

pf: $\int \delta(f(x))\, g(x)\, dx$

$= \sum_i \int_{U_i} \delta(f(x))\, g(x)\, dx$

use change of variable, let $a_i = f(x)$

$\Rightarrow = \sum_i \int_{f(U_i)} \delta(a_i)\, g(f^{-1}(a_i))\, df^{-1}(a_i)$

$= \sum_i \int_{f(U_i)} \delta(a_i) \frac{g(f^{-1}(a_i))}{f'(f^{-1}(a_i))} da_i$

$\Rightarrow \int \delta(f(x))\, g(x)\, dx = \sum \frac{1}{|f'(x_i)|} g(x_i)$

$\Rightarrow \delta(f(x)) = \sum_i \frac{1}{|f'(x_i)|} \delta(x - x_i)$

So, back to your question.

$$\delta(x^2-d^2) = \delta(f(d))$$

$$= \frac{1}{2|d|}\left[\delta(x-d) + \delta(x+d)\right]$$