

## Surds – Q2 [Problem/M](8/6/21)

Find the square roots of  $49 - 12\sqrt{5}$

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**Solution**

Let  $x^2 = 49 - 12\sqrt{5}$

Consider  $x = a + b\sqrt{5}$

Then  $a^2 + 2ab\sqrt{5} + 5b^2 = 49 - 12\sqrt{5}$

Let  $a^2 + 5b^2 = 49$  &  $2ab = -12$

[a variation on Equating Coefficients]

Looking for integer solutions, we see that either

$a = 2$  &  $b = -3$  or  $a = -2$  &  $b = 3$  work.