Power calculations for differences between two independent means

To calculate Cohen's d, we want the difference between two mean ($\mu_1-\mu_2$) under H1 minus the difference ($\mu_1-\mu_2$) under H0, divided by σ. Under H0 though, ($\mu_1-\mu_2$) is zero (because there is no difference between the means under the null hypothesis) so,

$$d = \frac{(\mu_1-\mu_2) - 0}{\sigma} = \frac{(\mu_1-\mu_2)}{\sigma}$$

An example

✳ Imagine the case where we want to test the difference between two group means. Imagine also that we expect the difference to be about 5 points. From past research, we know that the standard deviation (σ) is about 10.

$$d = \frac{(\mu1-\mu2)}{\sigma} = \frac{5}{10} = 0.5$$

d = 0.5 is a moderate effect size.