Test statistic used: the mean value of all rolls.

H_o (null hypothesis) is the die is fair because the sample mean does not statistically differ from the expected mean.

H_a (alternate hypothesis) is the die is not fair because the sample mean falls into the critical region.

Outcome	Freq	totals
1	7	7
2	9	18
3	14	42
4	7	28
5	18	90
6	5	30
	avg=	3.583333

Since we're sampling, let's use sampling theory, with a 2 tail test with an $\alpha = 0.05$.

We know from our data / experiment the sample mean:

$n := 60$ $\mu x_{bar} := 3.58333$ $s := 1.5436$

The statistics for a "fair" die follow a discrete uniform distribution AND are KNOWN. Since we know the underlying population standard deviation, we use the z statistic.

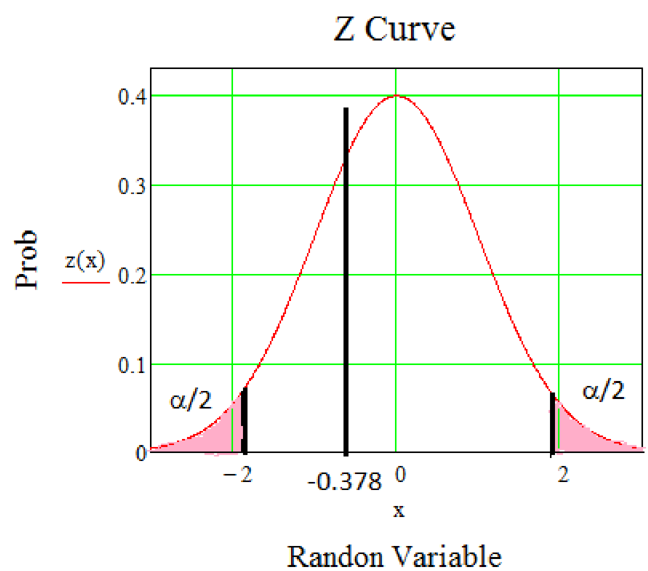
$$x_{bar} := \frac{(1+2+3+4+5+6)}{6} = 3.5 \qquad \sigma := \sqrt{\frac{6^2-1}{12}} = 1.708$$

Our z test statistic is:

$$z := \frac{x_{bar} - \mu x_{bar}}{\frac{\sigma}{\sqrt{n}}} = -0.378 \qquad z(x) := \text{dnorm}(x, 0, 1)$$

We know from the Z Chart that critical value = -1.96. The test statistic falls far short of entering the critical region!

Since the probability of the test statistic **does not** fall into the critical region (p > 0 .975 or p < 0.025), the Null Hypothesis (H_o) that the die is fair) **is NOT rejected**.



We have no reason to reject H_o (the null hypothesis stating that the die is FAIR).

WE MAKE NO ADDITIONAL statements! We would NEVER say "The die is fair."