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JC MATHEMATICS (H2)

STUDY TIPS

THE ROLE OF THE CRITICAL REGION WHEN TO REJECT THE NULL HYPOTHESIS

PREPARED BY
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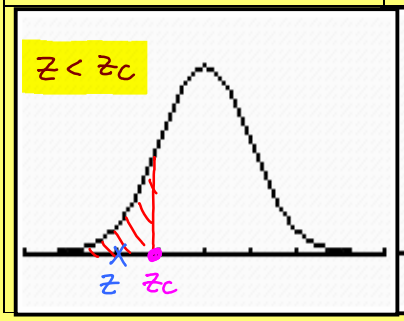
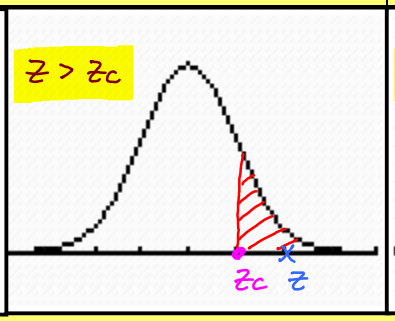
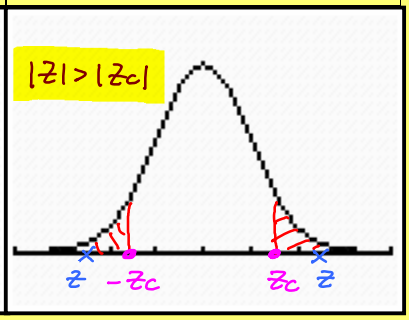
8. Use of Test Statistic

• Test Statistic vs Critical Value

In lesson 1, we conduct the testing using the comparison between the *p*-value and the level of significance. Here, we adopt another approach by comparing the test statistic and the critical value.

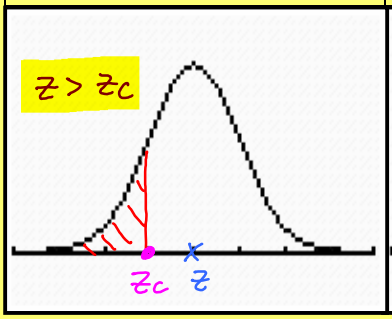
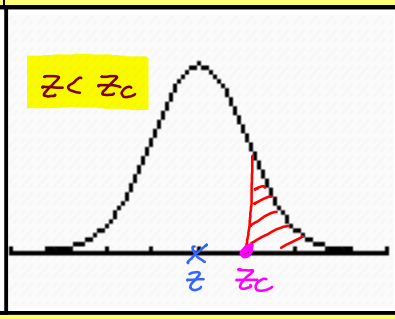
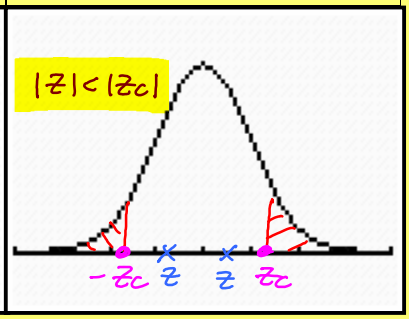
The test statistic falls _____inside_____ the critical region.

$\Rightarrow H_0$ is _____rejected at α% level_____.

$H_1 : \mu < \mu_0$	$H_1 : \mu > \mu_0$	$H_1 : \mu \neq \mu_0$
		

The test statistic falls _____outside_____ the critical region.

$\Rightarrow H_0$ is _____not rejected at α% level_____.

$H_1 : \mu < \mu_0$	$H_1 : \mu > \mu_0$	$H_1 : \mu \neq \mu_0$
		

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Explanation

In hypothesis testing, the critical region is the shaded area in the outer tail or tails of a probability distribution, bounded by the critical value. If your calculated test statistic falls inside this region, it indicates that the result is statistically extreme, leading you to reject the null hypothesis at the chosen significance level.

The exact location of this rejection area depends on the direction of your alternative hypothesis. For a left-tailed test, the critical region is located in the far left tail, meaning you reject the null hypothesis when the test statistic is smaller than the critical value.

For a right-tailed test, the region is in the far right tail, so you reject the null hypothesis when the test statistic is larger than the critical value.

Finally, for a two-tailed test, the critical region is split equally across both the left and right tails, leading to rejection whenever the test statistic falls beyond the positive or negative critical boundaries.

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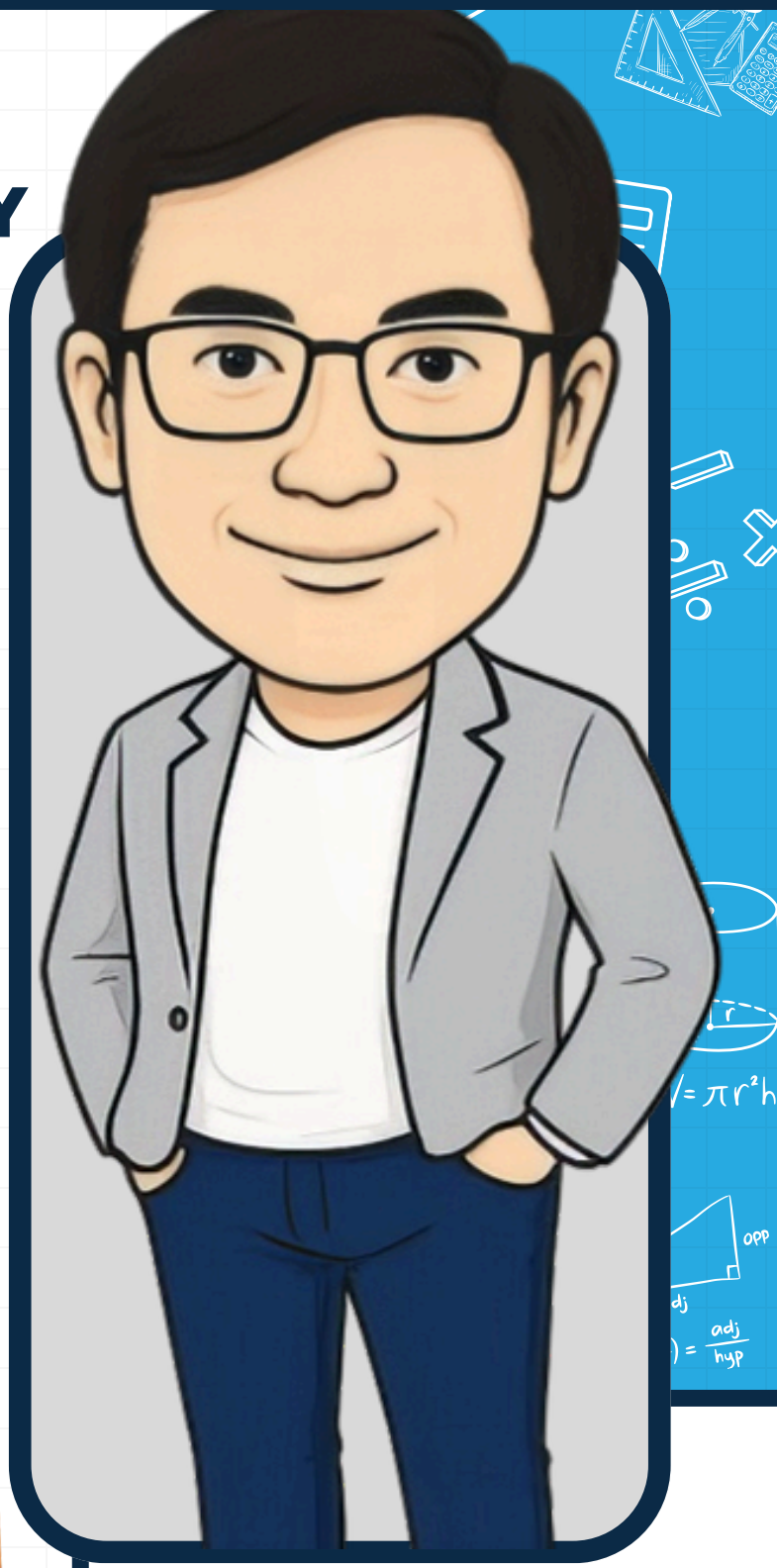
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