

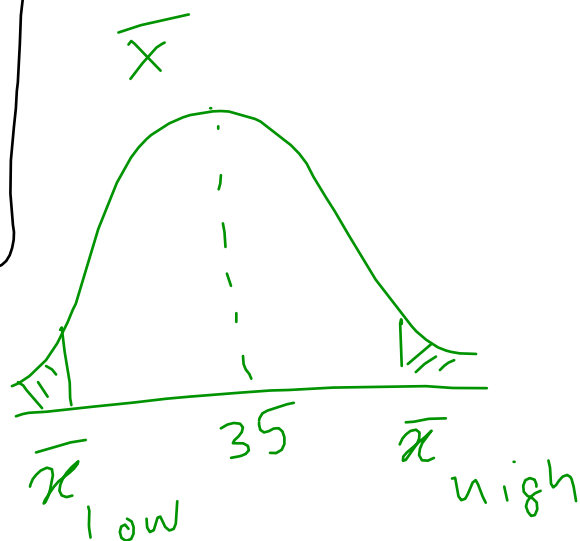
$$35$$

$$H_0 : \mu = 35$$

$$H_a : \mu > 35$$

$$\frac{\bar{x} - 35}{\sigma/\sqrt{n}}$$

z_{test}

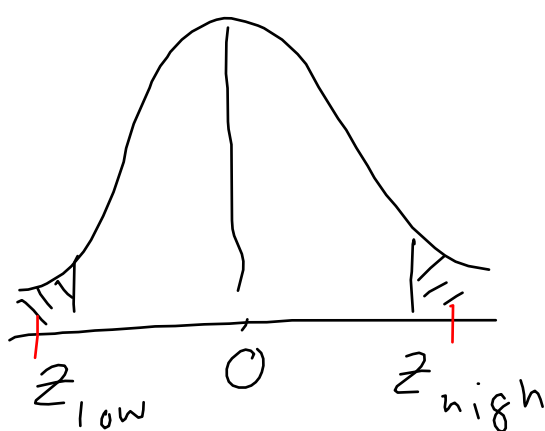


$$\mu \neq 35$$

$$\mu < 35$$

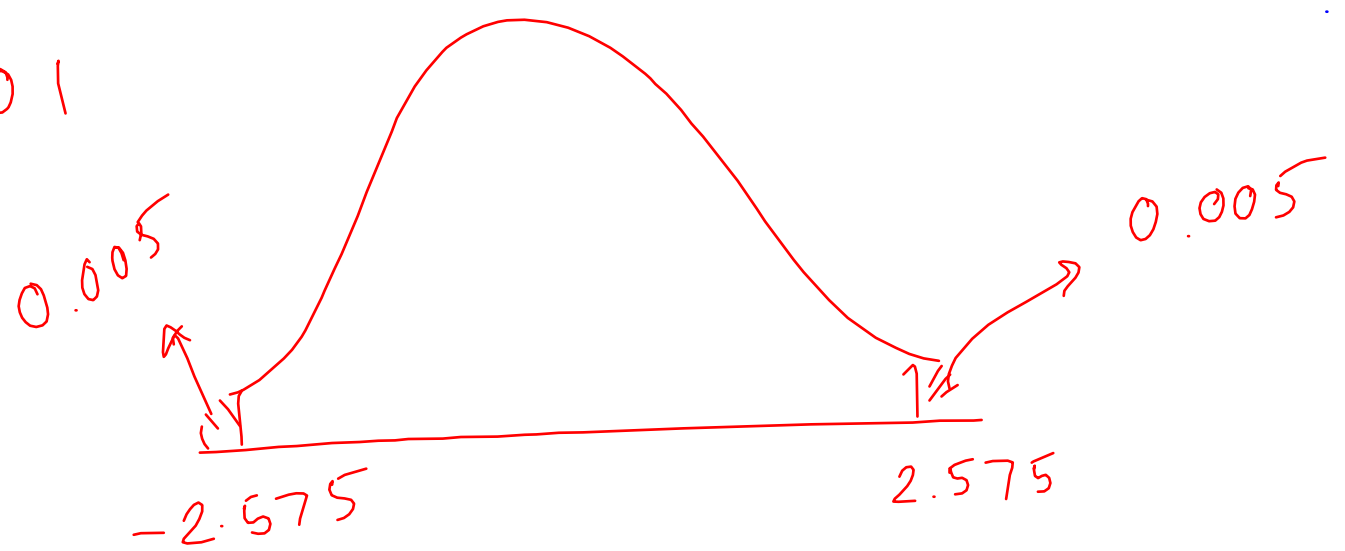
$$\boxed{\text{shaded}} = \alpha$$

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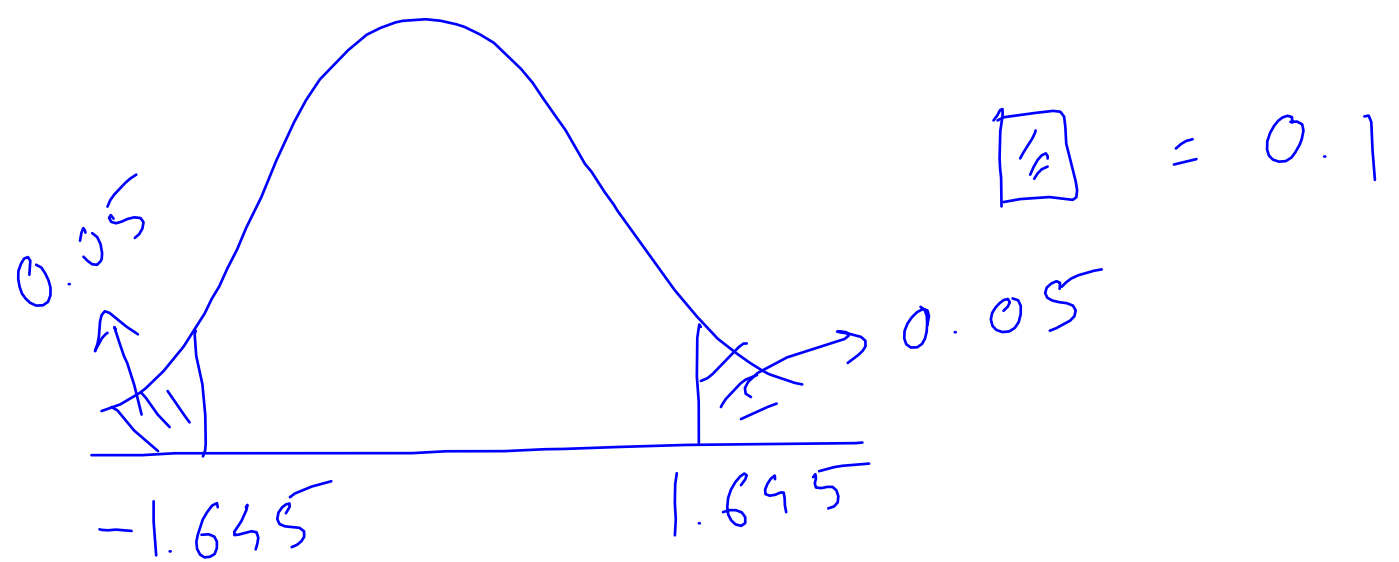


2-sided H_a

$$\alpha = 0.01$$



$$\alpha = 0.1$$



$$H_0: \mu = 35$$

$$\sigma = 5$$

$$H_a: \mu \neq 35$$

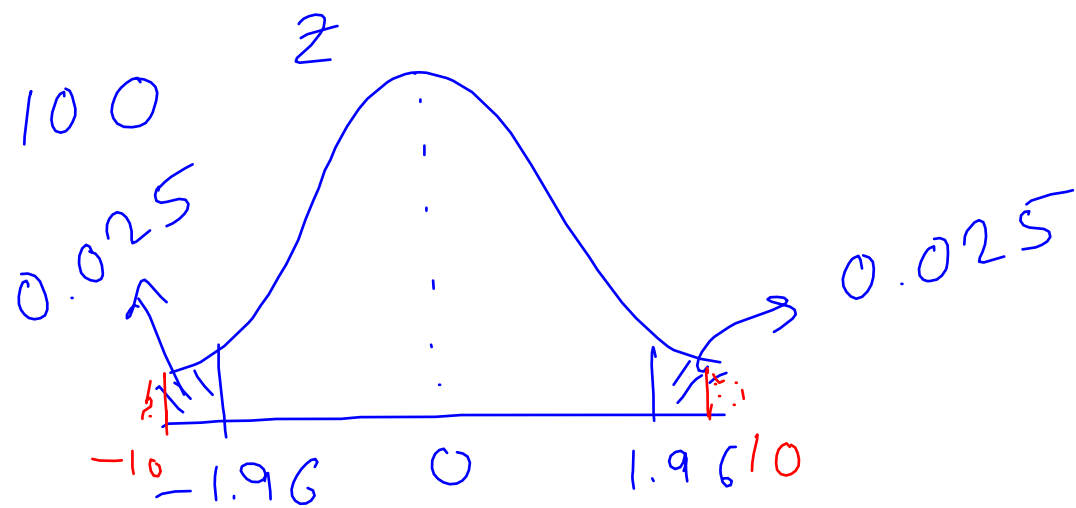
$$\alpha = 0.05$$

$$\bar{x} = 40 \quad n = 100$$

$$z_{test} = \frac{40 - 35}{5/\sqrt{100}}$$

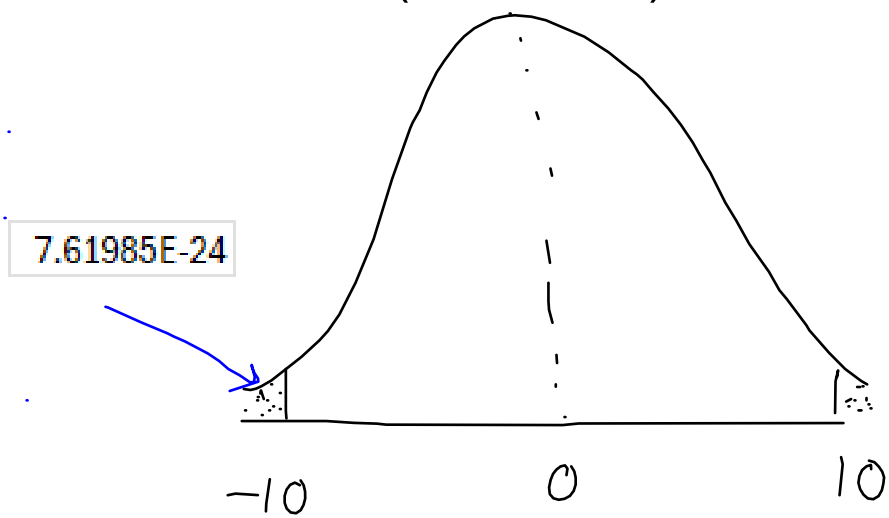
$$= \frac{5}{0.5}$$

$$= 10$$



$\Rightarrow$ Rej. $H_0 \because z_{test} > 1.96$

=NORM.S.DIST(-10,TRUE)



$$= P(z > 10)$$

$$+ P(z < -10)$$

$$< 0.05$$

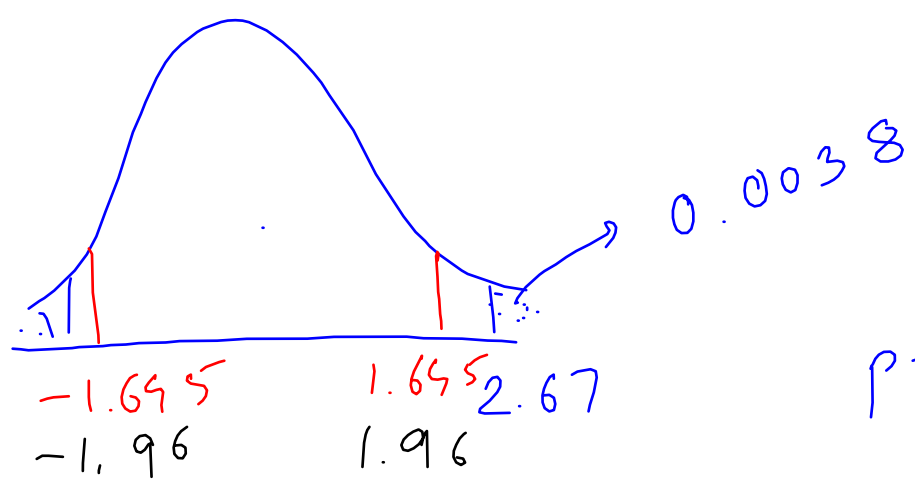
$$P(z > z_{test}) + P(z < -z_{test}) < \alpha$$

$$2 P(z > |z_{test}|) < \alpha$$



$$p\text{-value} < \alpha$$

$\Rightarrow$ Rej. H_0
o/w not



$$p\text{-value} = 2P(z > 2.67)$$

$$= 2 \times 0.0038$$

$$= 0.0076$$

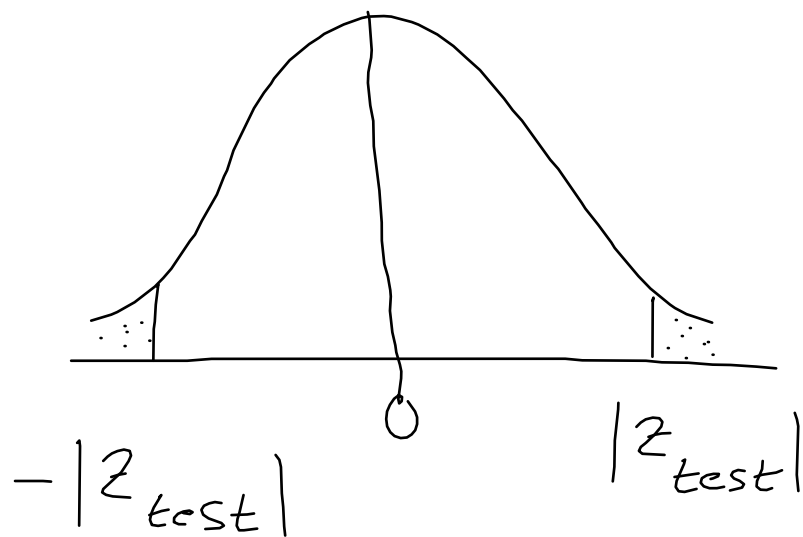
$$\alpha = 0.1$$

$$\alpha = 0.05$$

$$H_0: \mu = 35$$

$$H_a: \mu \neq 35$$

$$z_{test}$$



$$P = 2 P(Z > |z_{test}|)$$

$$= \text{p-value}$$

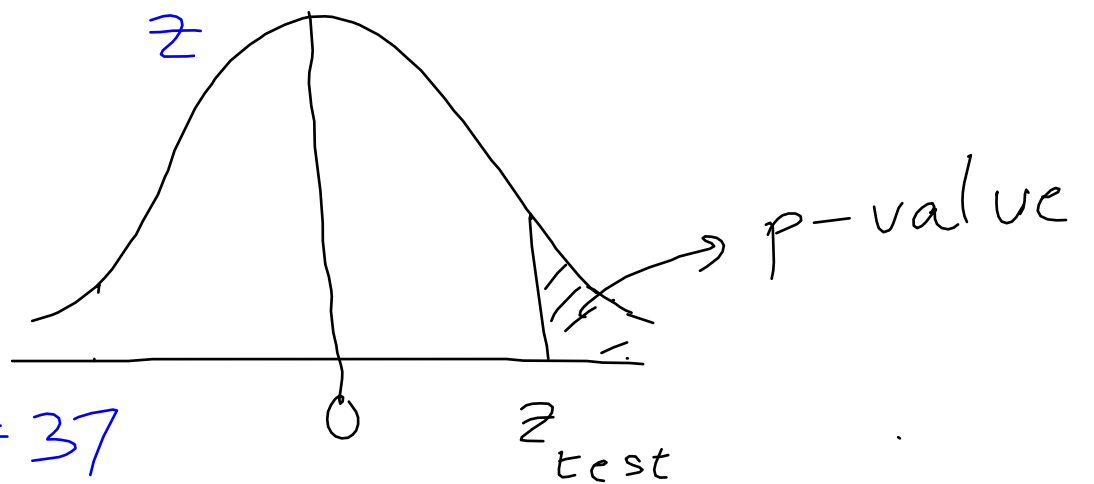
Rej. if $\text{p-value} < \alpha$

$$H_0: \mu = 35$$

$$H_a: \mu > 35$$

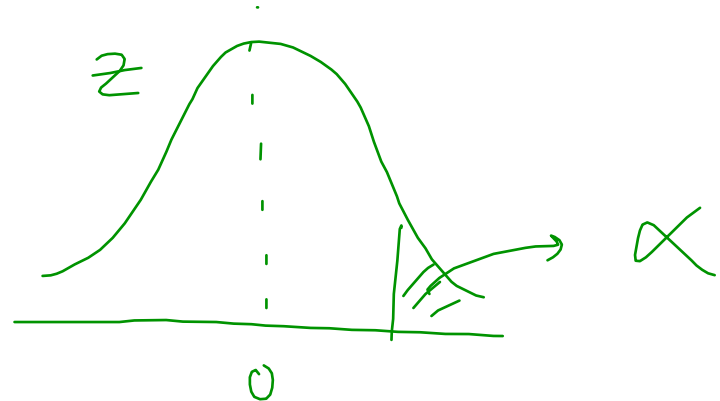
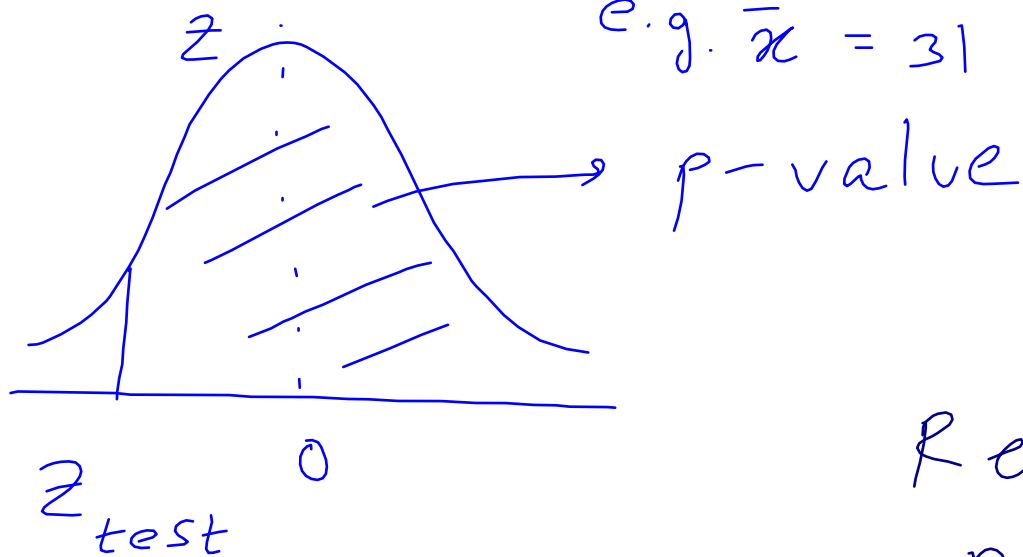
$$z_{test} > 0 \text{ e.g. if } \bar{x} = 37$$

$$P(Z > z_{test})$$



what if $z_{test} < 0$

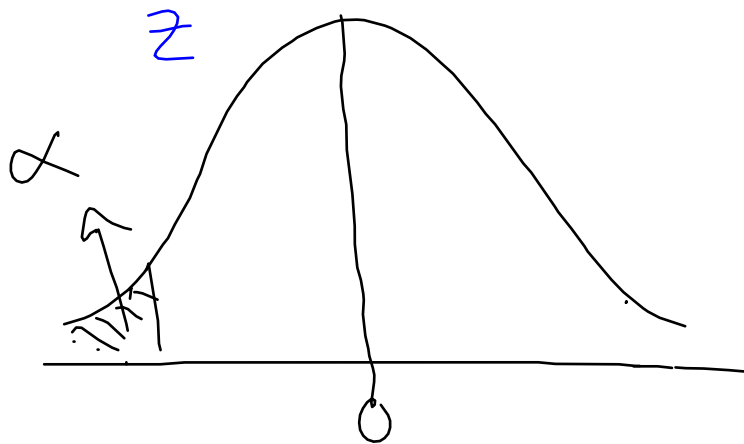
$$\text{e.g. } \bar{x} = 31$$



Rej. H_0 if
 $p\text{-value} < \alpha$

$$H_0: \mu = 35$$

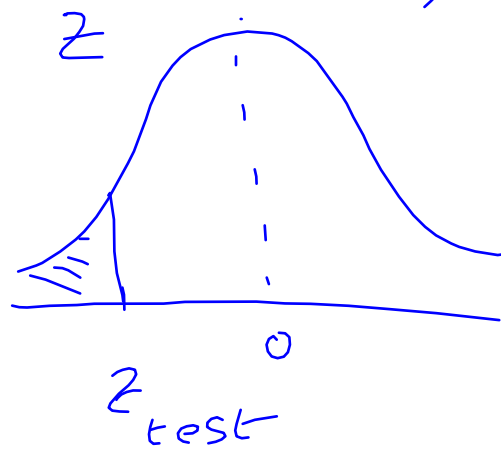
$$H_a: \mu < 35$$



$$p\text{-value} = P(z < z_{\text{test}})$$

$$z_{\text{test}} < 0$$

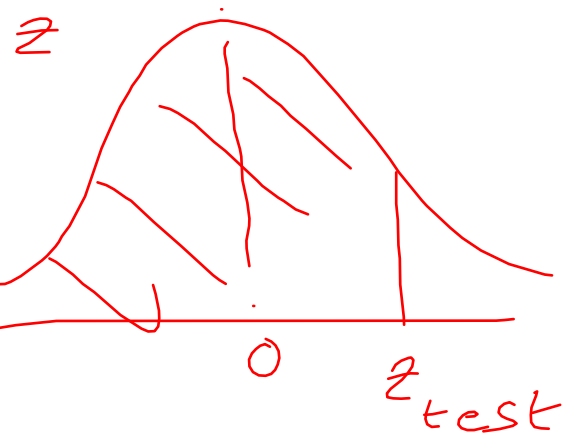
$$\text{e.g., } \bar{x} = 30$$



$$z_{\text{test}} > 0$$

$$\text{e.g., } \bar{x} = 40$$

$$p\text{-value} = P(z < z_{\text{test}})$$



Rej. H_0 if $p\text{-value} < \alpha$.