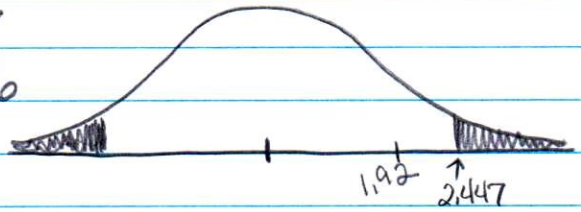
Fixed Mortgages

"differs"

① Null + Alternative Hyp.
$H_0: \mu = 4.27$
$H_A: \mu \neq 4.27$

$n = 7$
$df = 6$



$\alpha = 0.05$

② Critical value $t^*_{0.025,6} = 2.447$ [=T.INV.2T(0.05, 6)]

③ Test statistic $\bar{x} = 4.464$, $S = 0.2673$

$$t_6 = \frac{4.464 - 4.27}{0.2673/\sqrt{7}} = 1.92$$

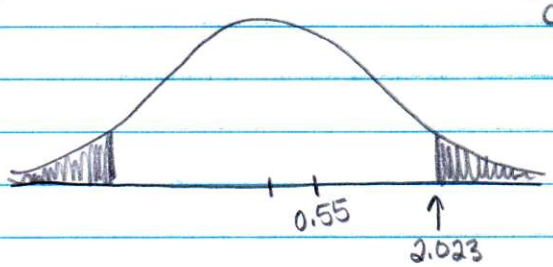
④ P-value 0.1033 [=T.DIST.2T(1.92,6)]
0.1033 > 0.05
Do not reject the null.

Monthly Sales

"differ"

① Null + Alternative Hyp.
$H_0: \mu = 130000$
$H_A: \mu \neq 130000$

$n = 40$
$df = 39$



$\alpha = 0.05$

② Critical value $t^*_{0.025,39} = 2.023$ [=T.INV.2T(0.05,39)]

③ Test Statistic $t_{39} = \frac{132625 - 130000}{30106/\sqrt{40}} = 0.55$
$\bar{x} = 132,625$
$S = 30,106$

④ P-value 0.5855 [=T.DIST.2T(0.55,39)]
0.5855 > 0.05
Do not reject the null.

Cell Phone Use

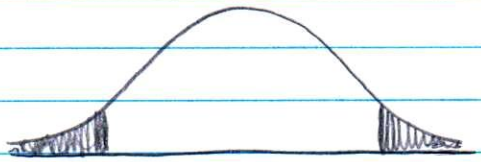
"differs"

① Null & Alternative Hyp.

$H_0: p = 0.25$

$H_A: p \neq 0.25$

$n = 200$



$\alpha = 0.05$

② Critical value $z^*_{0.025} = 1.96$ [= ABS(NORM.S.INV(0.05/2))]

③ Test Statistic

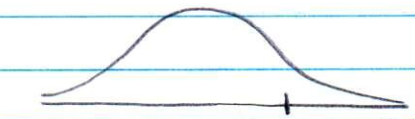
$\hat{p} = 60/200 = 0.3$

$$Z = \frac{0.3 - 0.25}{\sqrt{\frac{(0.3)(0.7)}{200}}} = 1.63$$

④ P-value 0.1031 [= (1 − NORM.S.DIST(1.63,1)) × 2]

$0.1031 > 0.05$

Do not reject the null



multiply by 2 to compare to α

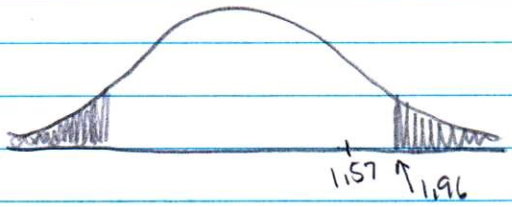
Proportion of Women — Part 1 — "different from"

① Null + Alternative Hyp.

$H_0: p = 0.28$

$H_A: p \neq 0.28$

$n = 50$



$\alpha = 0.05$

② Critical Value $Z^*_{0.025} = 1.96$ [=ABS(NORM.S.INV(0.05/2))]

③ Test Statistic

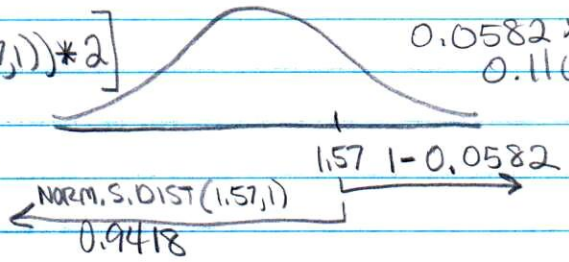
$\bar{p} = 19/50 = 0.38$

$$Z = \frac{0.38 - 0.28}{\sqrt{\frac{(0.28)(0.72)}{50}}} = 1.57$$

④ P-value 0.1164 [(1-NORM.S.DIST(1.57,1))*2]

$0.1164 > 0.05$

Do not reject the null hypothesis



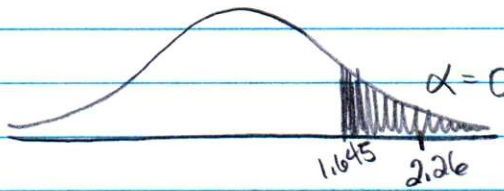
Proportion of Women — Part 2 — "more than"

① Null + Alternative Hyp.

$H_0: p \leq 0.5$

$H_A: p > 0.5$

$n = 50$



$\alpha = 0.05$ Right Tailed Test

② Critical Value $Z^*_{0.05} = 1.645$ [=ABS(NORM.S.INV(0.05))]

↑ Rt Tail so must be positive

③ Test Statistic

$\bar{p} = 0.66$

$$Z = \frac{0.66 - 0.5}{\sqrt{\frac{(0.5)(0.5)}{50}}} = 2.26$$

④ P-value 0.0119 [1-NORM.S.DIST(2.26,1)]

$0.0119 < 0.05$

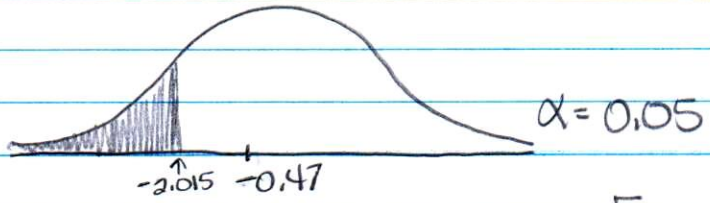
Reject the null hypothesis

Computer Prices

claim: "fallen below" left tailed test

① Null + Alternative Hyp.
$H_0: \mu \geq 350$
$H_A: \mu < 350$

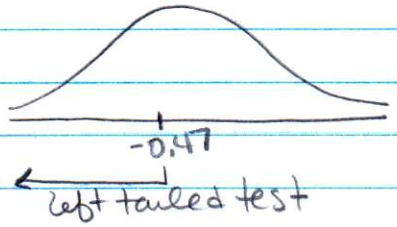
$n = 6$
$df = 5$



② Critical value $t^*_{0.05,5} = -2.015$ [=T.INV(0.05,5)]

③ Test Statistic $t_5 = \frac{340 - 350}{52/\sqrt{6}} = -0.47$
$\bar{x} = 340$ $s = 52$

④ P-value 0.3291 [=T.DIST(-0.47,5,1)]
0.3291 > 0.05
Do not reject the null hypothesis.

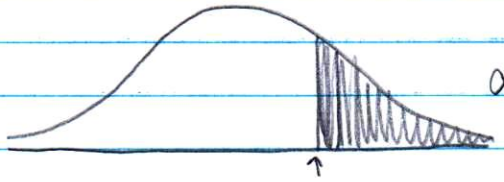


Movie Viewers

"more than" Right Tailed Test

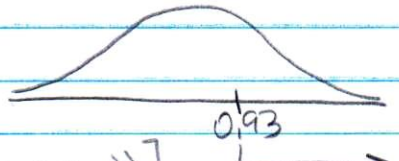
① Null + Alt Hyp.
$H_0: p \leq 0.3$
$H_A: p > 0.3$

$n = 200$



② Critical Value $z^*_{0.1} = 1.28$ [=NORM.S.INV(0.9)]

③ Test Statistic $z = \frac{0.33 - 0.3}{\sqrt{\frac{(0.3)(0.7)}{200}}} = 0.93$
$\bar{p} = 65/200 = 0.33$



④ P-value 0.1762 [=(1-NORM.S.DIST(0.93,1))]
0.1762 > 0.1
Do not reject the null hypothesis.