z-table 0.9726 1

1.92

1. $p\text{-value} = 2 \times P(Z > |z_{cal}|) = 2 \times P(Z > 1.92)$
$= 2 \times [1 - 0.9726] = 0.0548 > \alpha = 0.05$
fail to reject H_0 (1C)

2. "have changed" $\rightarrow$ 2 tailed test $H_0: p_1 = p_2 \Rightarrow H_0: p_1 - p_2 = 0$
(2C) $H_1: p_1 \neq p_2 \quad H_1: p_1 - p_2 \neq 0$

3. Eq 10.16 . two-proportions "$p_1 - p_2$" (3.B)

4. Critical value method : Critical value $\pm Z_{\frac{\alpha}{2}} = \pm Z_{0.025} = \pm 1.96$

$z_{cal} = 1.899$

$-1.96 \quad 0 \quad 1.96$

test stat < Critical Value on the right

fail to reject H_0, there is not enough evidence to conclude that the proportions have changed. (4C)

5. Key "Less than" ; Lower tail test $H_0: \mu_K - \mu_B \geq 0$ (5A)
$H_1: \mu_K - \mu_B < 0$

6. $\alpha = 0.05$ p-value Approach

use DF = 55 (Round it down)

DF	0.05	0.025
55	1.6730	2.0040

$|t_{cal}| = 1.897$

$t_{cal} = -1.897$ $p\text{-value} = 0.025$ to $0.05 < \alpha = 0.05$, Reject H_0

Critical value Approach : $CV = -t_\alpha$ (Lower tail)
$= -t_{0.05} = -1.6730$

$-1.6730 \quad 0$

test stat < CV on the Left   Reject H_0 (6D)

7. "Reducing" $\mu_1 > \mu_2$; $H_0: \mu_d \leq 0$; Ref. value $\mu_d = 0$
(7A) $H_1: \mu_d > 0$

8. $t_{cal} = \frac{\bar{d} - \mu_d}{s_d/\sqrt{n}} = \frac{1.1667 - 0}{1.169/\sqrt{6}} = 2.445$ (8D)

9. Use Critical Value Approach : $DF = n - 1 = 5$ upper tail $t_\alpha = t_{0.05} = 2.015$
(9B)

t_{cal}

$0 \quad 2.015$ test stat > CV on the Right . Reject H_0