

HW 4

Patrick Gardocki

2023-06-15

9-20

a)

$$\alpha = P(\bar{X} \leq 4.85) + P(\bar{X} > 5.15) = P\left(\frac{\bar{X}-5}{\frac{0.25}{\sqrt{8}}} \leq \frac{4.85-5}{\frac{0.25}{\sqrt{8}}}\right) + P\left(\frac{\bar{X}-5}{\frac{0.25}{\sqrt{8}}} > \frac{5.15-5}{\frac{0.25}{\sqrt{8}}}\right) = P(Z \leq -1.7) + P(Z > 1.7) = 0.04457 + (1 - 0.95543) = 0.08914$$

```
pnorm(-1.7)+(1-pnorm(1.7))
```

```
## [1] 0.08913093
```

b)

$$\text{Power} = 1 - \beta$$

$$\beta = P(4.85 \leq \bar{X} \leq 5.15) = P\left(\frac{4.85-5.1}{\frac{0.25}{\sqrt{8}}} \leq \frac{\bar{X}-5.1}{\frac{0.25}{\sqrt{8}}} \leq \frac{5.15-5.1}{\frac{0.25}{\sqrt{8}}}\right) = P(-2.83 \leq Z \leq 0.566) = P(Z \leq 0.566) - P(Z \leq -2.83) = 0.71566 - 0.00233 = 0.7133$$

```
pnorm(0.566)-(pnorm(-2.83))
```

```
## [1] 0.7119757
```

9-23

9-43(a)(b)

9-64 (a)(b)(e)

9-98

10-4(a)(b)(c)

10-14

10-24

10-52

10-88