Form A

1. (c) only

3. (a) 68% (b) When $np \geq 10$ and $n(1-p) \geq 10$

4. (c) It's an estimator of μ, the population mean difference in corneal thickness between an eye with glaucoma and a healthy eye.

(f) A bootstrap sample here satisfies these criteria
- draw from the original with replacement
- obtain a sample of the same size as original (violated here)

(g) A 99% bootstrap percentile interval should extend from the 0.5-percentile to the 99.5-percentile. With 1000 points, these percentiles are 5 away from the two ends. Estimating, that is approximately $(-10, 6.3)$.

(h) It mostly seems so. We likely
- have an SRS (not an iid), but $n = 8$ is a very small sample
- have a normal population (biological measurements, normal quantile plot mostly straight)

(i)
$$-2.125 \pm (3.4995)\frac{9.5982}{\sqrt{8}}, \quad \text{or} \quad (-14.00, 9.75)$$

5. (a) qnorm(0.06)

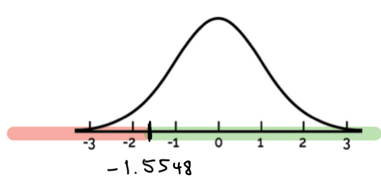
(b) $\hat{p} = \frac{57}{100} = 0.57$, $E(\hat{p}) = p = 0.6$, $Var(\hat{p}) = \sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{(0.6)(0.4)}{100}} = 0.04899$

$$\Rightarrow \quad Z = \frac{\hat{p} - p}{\sqrt{p(1-p)/n}} = \frac{0.57 - 0.6}{0.04899} \doteq -0.612$$

(c) pnorm(−0.612) or pbinom(57, 100, 0.6)

(d) (ii)

(e) The rejection region is $Z < -1.5548$, and so $Z = -0.612$ is in the nonrejection region. We fail to reject H_0.



(f) We reject H_0 when the Z-score

$$Z = \frac{0.57 - 0.6}{\sqrt{(0.6)(0.4)/n}} < -1.5548 \quad \Rightarrow \quad \left(\frac{0.03}{1.5548}\right)^2 > \frac{(0.6)(0.4)}{n}$$

$$\Rightarrow \quad n > \frac{(0.6)(0.4)}{(0.03/1.5548)^2} = 644.64.$$

$\boxed{\text{So } n = 645 \text{ is minimal.}}$