

Q1 a) 1250 b) 250 c) 5 d) name, gender, e) heart rate, age, hairs.

Q2 a) $81,238 - 33,001 = 48,237$ b) right skewed, mean > median.

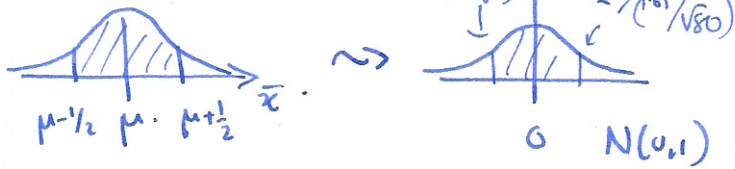
Q3 a) $X \sim N(11, 2)$ $IP(X \geq 14) = IP\left(\frac{X-11}{\sqrt{2}} \geq \frac{14-11}{\sqrt{2}}\right) = 1 - \text{pnorm}(1.5) = 6.7\%$
 $Z \sim N(0,1)$ $X = 11 + 2Z$

b) $\text{pnorm}\left(\frac{9-11}{\sqrt{2}}\right) = 15.9\%$.

c) $\text{pnorm}\left(\frac{12-14}{\sqrt{2}}\right) - \text{pnorm}\left(\frac{9-14}{\sqrt{2}}\right) = \text{pnorm}(-1) - \text{pnorm}\left(-\frac{5}{\sqrt{2}}\right) = 15.2\%$.

d) $\text{qnorm}(0.2) = -0.8416 = Z$ so $X = 11 + 2 \times -0.8416 = 12.2''$.

Q4 a), c) approx normal, b), d) not.

Q5 $N(\mu, 1.65)$ $\bar{x} \sim N\left(\mu, \frac{1.65}{\sqrt{80}}\right)$ $\mu = 0.5534$


$\text{pnorm}(0.8571) - \text{pnorm}(-0.8571) = 1 - 60.9\% = 39.1\%$.

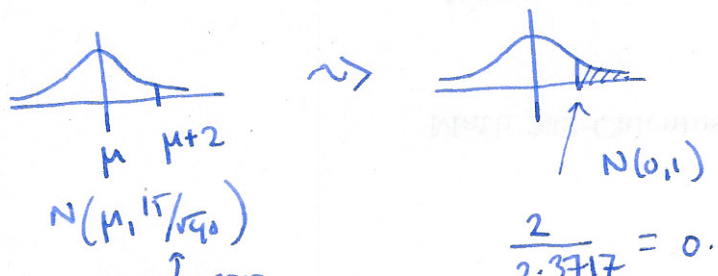
Q6 a) observational. b) no, really want to take obs of general pop and then compare running vs. knee injury

Q7 a) $0.1 \times 0.5 = 0.05$.

b) $IP(\text{all tails}) = 1/2^5$ $IP(\text{at least one head}) = 1 - 1/32 = 31/32$.

Q8 T, T, T, F, F, Can't say, T, F, T

Q9 a) i b) ii c) population $N(\mu, 15)$ $\bar{x} \sim N\left(\mu, \frac{15}{\sqrt{40}}\right)$


 $N(\mu, 15/\sqrt{40})$ $\uparrow 2.3717$
 $\frac{2}{2.3717} = 0.8433$
 $1 - \text{pnorm}(0.8433) = 20\%$