

$$(4) \quad 53^{\circ}16'26'' = 53.274 = \mu$$

$$1'13'' = 0.20278$$

$$x_1 = 53.267 \quad x_2 = 53.283$$

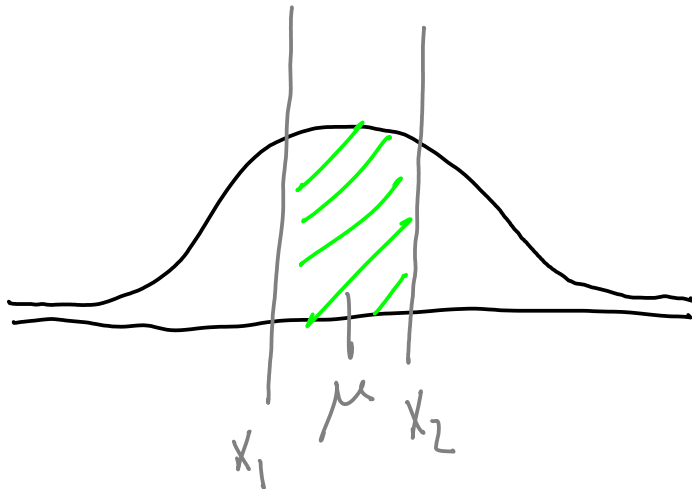
$$z_1 = \frac{53.267 - 53.274}{0.20278} = -0.35616$$

$$p = 0.35942$$

$$z_2 = \frac{53.283 - 53.274}{0.20278} = 0.46575$$

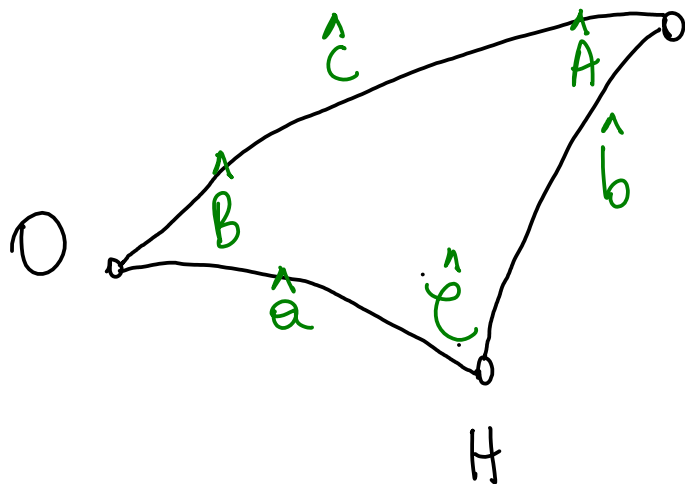
$$p = 0.68082$$

$$\Delta = 0.3214$$



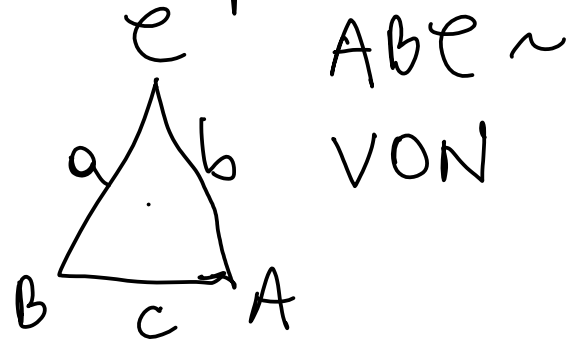
The probability that the angle is between $53^{\circ}16'$ and $53^{\circ}17'$ is 32.14%.

(5)



Let N be the north pole.

(i)



$$\cos c = \cos a \cos b + \sin a \sin b \cos C$$

$$= 0.32519 \rightarrow c = 71.023^\circ$$

$$\hat{c} = 71.023^\circ$$

$$a = 55.300^\circ$$

$$b = 40.750^\circ$$

$$C = 101.40^\circ$$

(ii) $AB C \sim HON$

$$\cos c = 59.338^\circ$$

$$\hat{a} = 59.338^\circ$$

$$a = 55.300^\circ$$

$$b = 68.700^\circ$$

$$C = 66.683^\circ$$

(iii) $AB C \sim VHN$

$$\cos c = 39.187^\circ$$

$$\hat{b} = 39.187^\circ$$

$$a = 68.700^\circ$$

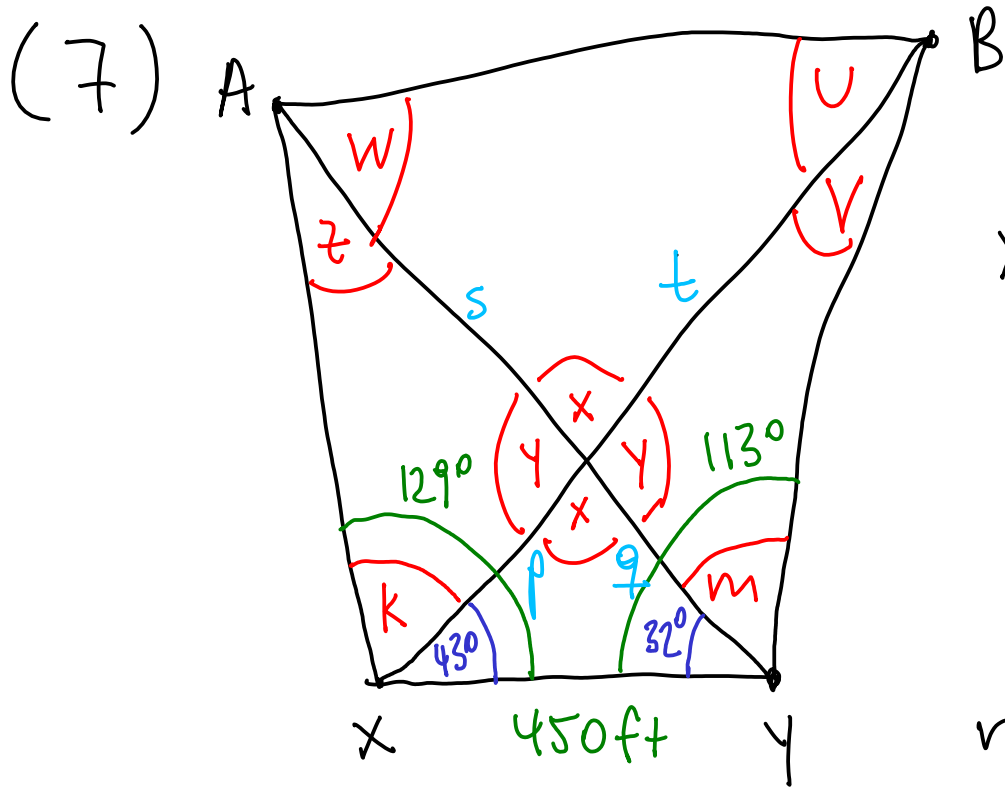
$$b = 40.750^\circ$$

$$C = 34.717^\circ$$

$$\cos \hat{a} = \cos \hat{b} \cos \hat{c} + \sin \hat{b} \sin \hat{c} \cos \hat{A}$$

$$\cos \hat{A} = \frac{\cos \hat{a} - \cos \hat{b} \cos \hat{c}}{\sin \hat{b} \sin \hat{c}} = 0.43167$$

$$\hat{A} = 64.427^\circ$$



$$x = 180^\circ - 32^\circ - 43^\circ = 105^\circ$$

$$y = 75^\circ$$

$$z = 180^\circ - 75^\circ - 86^\circ = 19^\circ$$

$$m = 81^\circ$$

$$\frac{p}{\sin 32^\circ} = \frac{450}{\sin 105^\circ} \rightarrow p = \sin 32^\circ \cdot \frac{450}{\sin 105^\circ}$$

$$p \approx 246.88$$

$$\frac{s}{\sin 86^\circ} = \frac{p}{\sin 19^\circ}$$

$$v = 180^\circ - 81^\circ - 75^\circ = 24^\circ$$

$$s = \sin 86^\circ \cdot \frac{246.88}{\sin 19^\circ} = 756.44$$

$$q = \sin 43^\circ \cdot \frac{450}{\sin 105^\circ} = 317.73$$

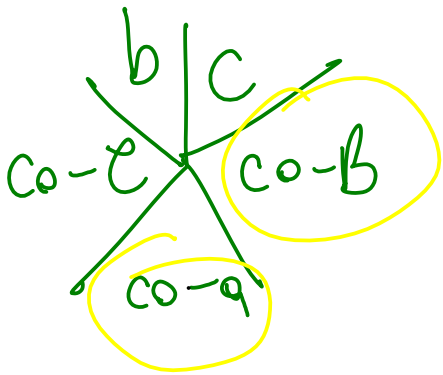
$$t = \sin 81^\circ \cdot \frac{q}{\sin 24^\circ} = 771.54$$

$$\overline{AB}^2 = s^2 + t^2 - 2st \cos 105^\circ$$

$$\overline{AB} = 1212.3$$

$$(8) \quad a = 109.0171$$

$$B = 37^\circ 15'$$



$$\sin b = \sin B \cdot \sin a = 0.57134$$

$$\rightarrow b = 34.843^\circ \text{ or } b = 145.16^\circ$$

\hookrightarrow reject / LoQ I

$$\sin c = \tan b \cdot \cot B = 0.91547$$

$$\rightarrow c = 66.273^\circ \text{ or } c = 113.73^\circ$$

\hookrightarrow reject. / LoQ III

$$\cos c = \cos c \cdot \sin b = 0.24356$$

$$\rightarrow c = 104.10^\circ$$

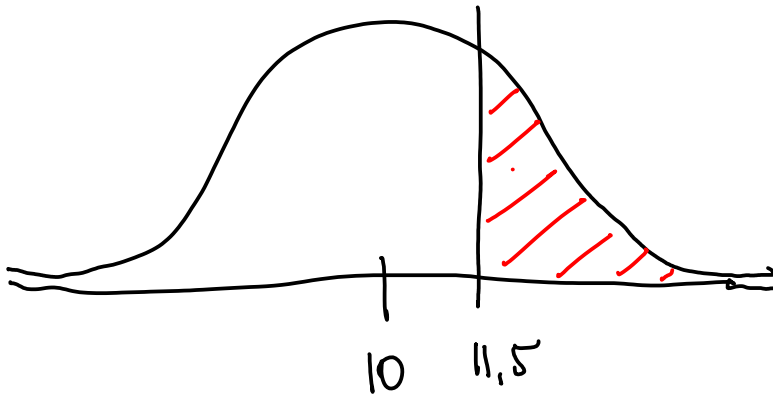
(9)

$$n = 50$$

$$p = 0.2$$

$$\mu = 50 \cdot 0.2 = 10$$

$$\sigma = \sqrt{50 \cdot 0.2 \cdot 0.8} = 2.8284$$



$$z = \frac{11.5 - 10}{2.8284} = 0.53$$

$$p = 0.70194$$

The probability that there are 12 or more men is approximately 0.29806.