

+ -  
Quiz 1C - Stats

Summer 2024

① Order:

4, 6, 7, 7, 8, 9, 12, 12

a) Loc.  $Q_1 = \left(\frac{25}{100}\right) \times 8 = 2 \xrightarrow{+0.5} 2.5$

$$Q_1 = \frac{6+7}{2} = 6.5$$

b) Loc.  $\tilde{x} = \frac{n+1}{2} = \frac{8+1}{2} = 4.5$

$$\tilde{x} = \frac{7+8}{2} = 7.5$$

c)  $S = \sqrt{\frac{\sum (x - \tilde{x})^2}{n-1}} \approx 2.80$

d) 7, 12

e) Loc.  $P_{82} = \left(\frac{82}{100}\right) \times 8 = 6.56 \rightarrow 7$

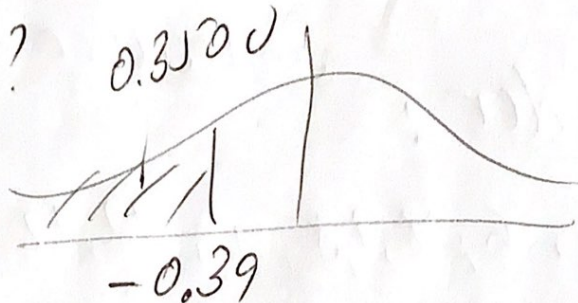
$$P_{82} = 12$$

f)  $\frac{4+12}{2} = 8$

②

$$\mu = 130, \quad \sigma = 15$$

$$P_{35} = ? \quad 0.3500$$



$$z = -0.39$$

$$P_{35} = \mu + z\sigma = 130 - 0.39 \times 15 = 124.15$$

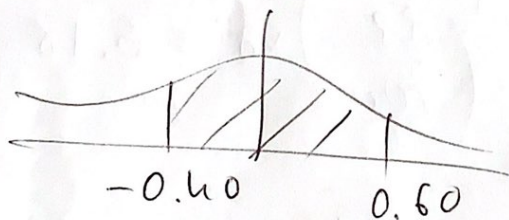
③

$$\mu = 20 \text{ bugs}; \quad \sigma = 5 \text{ bugs}$$

$$a) \quad P(18 < x < 23) = ?$$

$$z_1 = \frac{x - \mu}{\sigma} = \frac{18 - 20}{5} = -0.40$$

$$z_2 = \frac{23 - 20}{5} = 0.60$$



$$P(-0.40 < z < 0.60) =$$

$$0.7257 - 0.3446$$

$$= \boxed{0.3811}$$



-2-

$$b) P(X < 21) = ?$$

$$z = \frac{21 - 20}{5} = 0.20$$

$$P = (0.5793)$$

$$④ \quad p = 0.02; \quad q = 0.98; \\ n = 20$$

$$a) \quad P(X=4) = n C x \times p^x \times q^{n-x} \\ = 20 C_4 \times 0.02^4 \times 0.98^{16} = \boxed{0.0006} \\ (0.000561...)$$

$$b) \quad P(X \leq 2) = P(0) + P(1) + P(2) \\ = 20 C_0 \times 0.02^0 \times 0.98^{20} + 20 C_1 \times 0.02^1 \times 0.98^{19} \\ + 20 C_2 \times 0.02^2 \times 0.98^{18} = \boxed{0.9929}$$

⑤

a)  $m \approx -1.21$

$$m = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$

b)  $b \approx 35.64$

$$b = \bar{y} - m\bar{x}$$

$$\sum x = 43$$

$$\sum y = 126$$

$$\sum xy = 985$$

$$\sum x^2 = 451$$

---

⑥

a)  $w = 3 - 0.5 = \boxed{2.5}$

b)  $\frac{\cancel{21} 91}{21} \times 100 = \boxed{42.86\%}$

$$\sum x = n = 21$$