

Sample Quiz #3

1. Key word: "At most" $P(X \leq 2) = P(X=0) + P(X=1) + P(X=2)$
 $= 0.05 + 0.1 + 0.15 = 0.3$ (1C)

2.

x	f(x)	xf(x)
0	0.05	0 × 0.05 = 0
1	0.1	1 × 0.1 = 0.1
2	0.15	2 × 0.15 = 0.3
3	0.2	3 × 0.2 = 0.6
4	0.5	4 × 0.5 = 2.0

The mean $\mu = 3$ (2A)

3.

x	f(x)	(x-3) ² f(x)
0	0.05	(0-3) ² × 0.05 = 0.45
1	0.1	(1-3) ² × 0.1 = 0.4
2	0.15	(2-3) ² × 0.15 = 0.15
3	0.2	(3-3) ² × 0.2 = 0
4	0.5	(4-3) ² × 0.5 = 0.5

Var = $\Sigma = 1.5$

sta. dev: $\sigma = \sqrt{\text{Var}}$

$$= \sqrt{1.5}$$

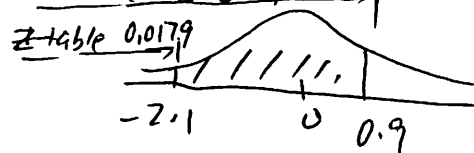
$$= 1.23$$

(3B)

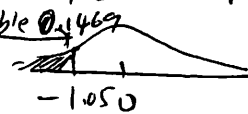
4. X can be any numerical value in an interval (4A)

5-7 Normal distribution $N(\mu = 45, \sigma = 10)$

5. $P(24 < X < 54) = P\left(\frac{24-45}{10} < \frac{X-\mu}{\sigma} < \frac{54-45}{10}\right)$
 $= P(-2.1 < Z < 0.9)$
 $= 0.8159 - 0.0179$
 $= 0.798$ (5B)



6. $P(X < 34.5) = P\left(\frac{X-\mu}{\sigma} < \frac{34.5-45}{10}\right) = P(Z < -1.05)$
 $= 0.1469$ (6D)



7. Step 1 find z $z \uparrow$
 step 2 $X = \mu + z\sigma = 45 + (-0.5) \times 10 = 40$ (7A)

8-9 binomial distribution $b(n=5, p=0.25)$

key word "At least" 8. $P(X \geq 2) = 1 - [P(X=0) + P(X=1)]$ ($P(A) = 1 - P(A^c)$)
 $= 1 - \left[\frac{5!}{0!(5-0)!} \times 0.25^0 \times 0.75^5 + \frac{5!}{1!(5-1)!} \times 0.25^1 \times 0.75^4 \right]$
 $= 1 - [0.75^5 + 5 \times 0.25 \times 0.75^4] = 0.3672$ (8C)

9. $\mu = n \times p = 5 \times 0.25 = 1.25$ (9B)