

Quiz 4 for Statistics 301
Elementary Statistical Methods - Fall 1999
Material Covered: Sections 7.1,7.2 of Workbook and Sections 7.1 of text
For: 22nd October

Name (please print): _____
last first

Suppose we have five children who are outpatients in a community mental health center, whose ages are 6, 8, 10, 12 and 14.

1. [1] Two children are chosen at random from the five. The number of all possible samples of size 2 (if we sample with replacement were order matters) is (circle one) **10 / 15 / 20 / 25 / 30**.
2. [1] The chance the average age of the two children chosen at random is 6 is (circle one) **0.04 / 0.08 / 0.12 / 0.16 / 0.20**.
3. [2] Consider the following incomplete sampling distribution.

\bar{x}	6	7	8	9	10	11	12	13	14
$P(X = \bar{x})$	(a)	0.08	(b)	(c)	(d)	(e)	0.12	(f)	0.04

Complete this sampling distribution by filling in the following table.

(a)	(b)	(c)	(d)	(e)	(f)

4. [1] The expected value
is _____.
5. [1] The variance
is _____.

1. [1] 25
2. [1] 0.04
3. [2] The joint distribution is

$P(x_1, x_2)$ \bar{x}	6	x_1 8	10	12	14
6	6 0.04	7 0.04	8 0.04	9 0.04	10 0.04
x_2 8	7 0.04	8 0.04	9 0.04	10 0.04	11 0.04
10	8 0.04	9 0.04	10 0.04	11 0.04	12 0.04
12	9 0.04	10 0.04	11 0.04	12 0.04	13 0.04
14	10 0.04	11 0.04	12 0.04	13 0.04	14 0.04

where, notice, $P(x_1, x_2) = \frac{1}{5} \times \frac{1}{5} = 0.04$ for all x_1 and x_2 (since both children are chosen at random) and so the sampling distribution is

\bar{x}	6	7	8	9	10	11	12	13	14
$P(X = \bar{x})$	0.04	0.08	0.12	0.16	0.20	0.16	0.12	0.08	0.04

and so, filling in the table,

(a)	(b)	(c)	(d)	(e)	(f)
0.04	0.12	0.16	0.20	0.16	0.08

4. [1] 10; $E(\bar{X}) = \mu = \frac{6+8+10+12+14}{5} = 10$
5. [1] 4; since $V(X) = 0.2(6 - 10)^2 + \dots + 0.2(14 - 10)^2 = 8$; $V(\bar{X}) = \frac{V(X)}{2} = \frac{8}{2} = 4$