UNIVERSITY AT ALBANY
STATE UNIVERSITY OF NEW YORK

AMAT 108 Elementary Statistics
Fall 2024

Exam 2
Version A

Print Name: **Answer Key**

UAlbany Email:

Directions: You have **80 minutes** to answer the following questions. For all multiple-choice questions, select **one** answer from among the choices given. No explanation is required to be shown, and no partial credit will be given. Make sure to **completely** fill in the circle corresponding to your chosen answer.

For all free-response questions, you **must** show all necessary work to receive full credit. An answer with no work, even if correct, will not receive full credit. Please circle or box your final answer. All work, if needed, is to be rounded to **at least five** decimal places.

No notes, textbooks, mobile phones, or other aids are allowed. Only scientific calculators are allowed. **Do not detach these pages.**

Please indicate your section with a check mark (✓) in the left-most column.

✓	Section	Instructor Name	Meeting Time	Meeting Days	Meeting Location
	1724	Douglas Rosenberg	3:00PM	T/TH	ES 140
	1725	James Lamatina	12:00PM	T/TH	LC 25
	1726	John Racquet	3:00PM	M/W	LC 2
	3414	Chris Lange	4:30PM	T/TH	HU 132
	3807	Tung Lam	11:40AM	M/W	HU 129
	3808	Luciano Medina	10:30AM	T/TH	ES 144
	3809	James Lamatina	9:00AM	T/TH	HU 124
	4551	Tung Lam	8:00AM	M/W	ES 140
	4803	Peter Young	9:00AM	T/TH	ES 139
	4960	Peter Young	12:00PM	T/TH	ES 140
	5574	Chris Lange	3:00PM	T/TH	SS 133

Exam Scoring:

Page	Possible Points	Points Earned
3	4	
4	17	
5	17	
6	13	
7	10	
Total Points	61	
Percentage		

Percentage Conversion Chart:

Raw Score	Percentage	Raw Score	Percentage	Raw Score	Percentage
1	2	21	34	41	67
2	3	22	36	42	69
3	5	23	38	43	70
4	7	24	39	44	72
5	8	25	41	45	74
6	10	26	43	46	75
7	11	27	44	47	77
8	13	28	46	48	79
9	15	29	48	49	80
10	16	30	49	50	82
11	18	31	51	51	84
12	20	32	52	52	85
13	21	33	54	53	87
14	23	34	56	54	89
15	25	35	57	55	90
16	26	36	59	56	92
17	28	37	61	57	93
18	30	38	62	58	95
19	31	39	64	59	97
20	33	40	66	60	98
A student who scores 61 scored 100% on the exam.					

Questions 1-3 are based on the following: Suppose we are given that $P(H) = 0.59$, $P(K) = 0.37$, and $P(H \cap K) = 0.1784$.

1. Find $P(K^C)$. (1 pt.)

① 0.37
④ 0.41
② 0.59
⑤ None of the previous options.
3 0.63

2. Find $P(H \cup K)$, given that events H and K are mutually exclusive (disjoint). (1 pt.)

① 0
④ 0.22
2 0.96
⑤ 0.8216
③ 0.2183

3. Find $P(K|H)$. (1 pt.)

① 0.6271
④ 0.37
② 0.48216
5 0.30237
③ 1.59459

4. Using the standard normal curve, find $P(-2.38 \leq Z \leq 0.17)$. (1 pt.)

1 0.5588
④ −2.21
② 0.0054
⑤ 0.9864
③ 0.0136

5. From a sample of 150 people that drive to work, 116 of them drive alone. Compute the following probabilities and **round all answers to four decimal places, if necessary**.
   (a) The first worker drives to work alone. (3 pts.)

(1) $$\frac{116}{150} \approx 0.7733$$

- +2 for fraction (one point for numerator and one point for denominator)
- +1 for answer to four decimal places

   (b) The second worker drives to work alone, **given** that the first worker drives to work alone. Assume we are **sampling without replacement**. (3 pts.)

(2) $$\frac{115}{149} \approx 0.7718$$

- +2 for fraction (one point for numerator and one point for denominator)
- +1 for answer to four decimal places

   (c) The second worker drives to work alone, **given** that the first worker does not drive to work alone. Assume we are **sampling without replacement**. (2 pts.)

(3) $$\frac{116}{149} \approx 0.7785$$

- +1 for numerator
- +1 for denominator and answer to four decimal places

   (d) None of four workers drive to work alone when **sampling with replacement**. (3 pts.)

(4) $$\frac{34}{150} \times \frac{34}{150} \times \frac{34}{150} \times \frac{34}{150} = \left(\frac{34}{150}\right)^4 \approx 0.0026$$

- +2 for work (one point for fractions and one point for multiplication)
- +1 for answer to four decimal places

   (e) At least one of four workers drives to work alone when **sampling with replacement**. (3 pts.)

(5) $$1 - \left(\frac{34}{150}\right)^4 \approx 1 - 0.0026 = 0.9974$$

- +2 for work (one point for $1-$ and one point for answer from (4))
- +1 for answer

6. Suppose the probability that a person is between 15 and 24 years of age is 0.132. Also suppose the probability that a person is between 15 and 24 years of age and spends at least 60 minutes online per day is 0.086. Compute the probability that a person spends at least 60 minutes online per day, given that they are between 15 and 24 years of age. **Round your answer to four decimal places.** (3 pts.)

(6) $$P(\text{at least 60 minutes}|\text{15-24 years of age}) = \frac{P(\text{at least 60 minutes and 15-24 years of age})}{P(\text{15-24 years of age})}$$

(7) $$= \frac{0.086}{0.132}$$

(8) $$\approx 0.6515$$

- +2 for fraction (one point for numerator and one point for denominator)
- +1 for (8)

7. A probability distribution of a discrete random variable X is given below:

X	4	9	15
Probability	0.62	0.31	0.07

(a) Find the mean (expected value) of the discrete random variable X. **Do not round your answer.** (3 pts.)

(9) $$\mu_X = E(X) = 4(0.62) + 9(0.31) + 15(0.07)$$

(10) $$= 2.48 + 2.79 + 1.05 = 6.32$$

- $\boxed{+2}$ for showing and adding products as in (9) (one point for each)
- $\boxed{+1}$ for right-hand side of (10)
- $\boxed{-2}$ if $\mu_X = (4 + 9 + 15)/3 \approx 9.33$ shown
- $\boxed{-3}$ if $\mu_X = (0.62 + 0.31 + 0.07)/3 \approx 0.33$ shown

(b) Find the standard deviation of the discrete random variable X. **Round your answer to three decimal places.** (5 pts.)

(11) $$\sigma_X = \sqrt{.62(4 - 6.32)^2 + .31(9 - 6.32)^2 + .07(15 - 6.32)^2}$$

(12) $$= \sqrt{3.337088 + 2.226544 + 5.273968} = \sqrt{10.8376} \approx 3.292$$

- $\boxed{+2}$ for each deviation squared and multiplying by associated probability (one point each)
- $\boxed{+2}$ for adding products and taking square root (one point each)
- $\boxed{+1}$ for right-hand side of (12)

Note: Some students may do this...

(13) $$E(X^2) = 4^2(0.62) + 9^2(0.31) + 15^2(0.07)$$

(14) $$= 9.92 + 25.11 + 15.75 = 50.78$$

(15) $$\sigma_X = \sqrt{50.78 - (6.32)^2} = \sqrt{10.8376} \approx 3.292$$

- $\boxed{+3}$ for showing and adding each product (one point each) and for value of $E(X^2)$ (one point)
- $\boxed{+2}$ for (15) (one point for left-hand side and one point for right-hand side)

8. Suppose Y is a continuous random variable that follows a uniform distribution from $y = 15$ to $y = 67$ (the interval is $(15, 67)$).

(a) Find the height of the density curve. **Leave your answer in fractional form.** (2 pts.)

(16) $$\text{Height} = \frac{1}{67 - 15} = \frac{1}{52}$$

- $\boxed{+2}$ for (16) (one point for numerator and one point for denominator)

Note. Students should (but are not required to) show the subtraction work.

(b) Compute $P(Y \leq 20)$. **Round your answer to three decimal places.** (3 pts.)

(17) $$P(Y \leq 20) = \frac{20 - 15}{52} \approx 0.096$$

- $\boxed{+2}$ for work (one point for the base and one point for the product)
- $\boxed{+1}$ for (17)

Note. If the student gives 0.385 as their answer with work shown, deduct one point.

9. In 2011, the average wait time at a drive-in window of a local bank is 10.3 minutes with a standard deviation of 2.7 minutes. Assuming the distribution is approximately normal, what is the cut-off wait time at the drive-in window that represents the 74^{th} percentile (lowest 74%)? **Round your answer to two decimal places.** (4 pts.)

(18) $z \approx 0.64$

(19) $x \approx 0.64(2.7) + 10.3$

(20) $= 12.03$

- $\boxed{+2}$ for (18) and (20) (one point each)
- $\boxed{+2}$ for showing correct values in (19) and solving for x (or using the algebra steps) (one point each)

Note. If the student used $z \approx 0.65$ to get $x \approx 12.06$, deduct one point.

10. A college financial aid advisor claims that the mean cost of textbooks per semester for all students is \$601 with a standard deviation of approximately \$95. Assume a random sample of 80 students from this college is selected.

(a) Is the distribution of $\overline{X}$ normal? (1 pt.)

① No, and we cannot conclude anything about the distribution of $\overline{X}$.

② No, but the distribution is approximately normal because the sample size is large enough.

③ Yes, because the population has a normal distribution with mean \$601 and standard deviation \$95.

(b) Find the mean and the standard deviation of the sampling distribution of $\overline{X}$. **Round the standard deviation to five decimal places.** (4 pts.)

(21) $\mu_{\overline{X}} = 601$

(22) $\sigma_{\overline{X}} = \dfrac{95}{\sqrt{80}}$

(23) ≈ 10.62132

- $\boxed{+1}$ for (21) and (23) (one point each)
- $\boxed{+2}$ for (22) (one point for numerator and one point for denominator with square root)

(c) Find the z-score for a sample mean of \$590. **Round your answer to two decimal places.** (3 pts.)

(24) $z \approx \dfrac{590 - 601}{10.62132}$

(25) ≈ -1.04

- $\boxed{+2}$ for (24) (one point for correctly shown numerator and one point for denominator)
- $\boxed{+1}$ for (25)

(d) Find $P(\overline{X} < 590)$. (1 pt.)

(26) $P(\overline{X} < 590) \approx P(Z < -1.04) \approx 0.1492$ $\boxed{+1}$

(e) Find $P(590 < \overline{X} < 612)$. **Note:** This is an example of symmetric limits. (4 pts.)

(27) $P(590 < \overline{X} < 612) \approx P(-1.04 < Z < 1.04)$ $\quad$ $P(590 < \overline{X} < 612) \approx P(-1.04 < Z < 1.04)$

(28) $= P(Z < 1.04) - P(Z < -1.04)$ $\quad$ $= 1 - 2P(Z < -1.04)$

(29) $\approx 0.8508 - 0.1492$ $\quad$ $\approx 1 - 2(0.1492)$

(30) $= 0.7016$ $\quad$ $= 0.7016$

+1 for z-score endpoints in (27)
+1 for finding 0.8508 in (29)
+1 for finding 0.1492 in (29)
+1 for (30)

+1 for 1− in (28)
+1 for doubling in (28)
+1 for (29)
+1 for (30)

11. A recent study indicated that 27% of all Americans read several times a week. Assume a random sample of 130 Americans is selected.

(a) Is the distribution of $\hat{p}$ normal? (1 pt.)

① No, and we cannot conclude anything about the distribution of $\hat{p}$.

② Yes, because the population of interest has a normal distribution.

● 3 No, but $\hat{p}$ has an approximate normal distribution because the success-failure conditions are met.

④ No, but $\hat{p}$ has an approximate normal distribution because the sample size is large enough.

(b) Find the mean and standard deviation of the sampling distribution of $\hat{p}$. **Round the standard deviation to five decimal places.** (4 pts.)

(31) $$\mu_{\hat{p}} = 0.27$$

(32) $$\sigma_{\hat{p}} = \sqrt{\frac{.27(1-.27)}{130}} \approx 0.03894$$

- +2 for (31) and right-hand side of (32) (one point each)
- +2 for left-hand side of (32) (one point for fraction and one point for square root)

(c) Find the z-score for a sample proportion of 0.32. **Round your answer to two decimal places.** (3 pts.)

(33) $$z \approx \frac{0.32 - 0.27}{0.03894}$$

(34) $$\approx 1.28$$

- +2 for (33) (one point for correctly shown numerator and one point for denominator)
- +1 for (34)

(d) Find $P(\hat{p} > 0.32)$. (2 pts.)

(35) $$P(\hat{p} > 0.32) \approx P(Z > 1.28) \approx 1 - 0.8997 = 0.1003$$

- +2 for (35) (one point for 1− and one point for answer

Note. If the student shows $P(\hat{p} > 0.32) \approx P(Z > 1.28) = P(Z < -1.28) \approx 0.1003$, award one point for flipping inequality and negating z-score, and award one point for the answer.

Formula Sheet:

- Probability:

$$P(A \cup B) = P(A \text{ or } B) = P(A) + P(B) \text{ if events } A \text{ and } B \text{ are disjoint}$$
$$P(A \cap B) = P(A \text{ and } B) = P(A)P(B) \text{ if events } A \text{ and } B \text{ are independent}$$

- Complement probability (probability complement rule): $P(A^C) = P(\text{not } A) = 1 - P(A)$

- At least 1 Rule: $P(\text{at least 1 success in } n \text{ trials}) = 1 - P(\text{no successes in } n \text{ trials})$

- Finding the height of a uniform distribution:

$$\text{Height} = \frac{1}{\text{Base}} = \frac{1}{b-a}$$

- Probability (area) of a uniform distribution: Probability (or area) = Base $\cdot$ Height

- Mean and standard deviation of discrete random variable X with possible values $x_1, x_2, \ldots, x_n$:

$$\mu_X = E(X) = x_1p(x_1) + x_2p(x_2) + \cdots + x_np(x_n)$$
$$\sigma_X = \sqrt{(x_1-\mu_X)^2p(x_1) + (x_2-\mu_X)^2p(x_2) + \cdots + (x_n-\mu_X)^2p(x_n)} = \sqrt{E(X^2) - (E(X))^2}$$

- Mean and standard deviation for sampling distribution of $\overline{X}$:

$$\mu_{\overline{X}} = \mu \qquad\qquad \sigma_{\overline{X}} = \frac{\sigma}{\sqrt{n}}$$

  where μ = population mean and σ = population standard deviation

- Standardized variable (z-score) for $\overline{X}$ (when σ known):

$$Z = \frac{\overline{X} - \mu}{\left(\frac{\sigma}{\sqrt{n}}\right)}$$

- Mean and standard deviation for sampling distribution of $\hat{p}$:

$$\mu_{\hat{p}} = p \qquad\qquad \sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$$

- Standardized variable (z-score) for $\hat{p}$:

$$Z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}}$$

- Success/failure condition for the sampling distribution of $\hat{p}$ to be approximately normal:

$$np \geq 10 \qquad\qquad n(1-p) \geq 10$$

Standard Normal Table

Table Values Represent Area to the Left of the z-score

z^*	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
−3.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
−3.80	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.70	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.60	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
−3.50	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
−3.40	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
−3.30	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
−3.20	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
−3.10	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
−3.00	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
−2.90	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
−2.80	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
−2.70	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
−2.60	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
−2.50	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
−2.40	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
−2.30	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
−2.20	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
−2.10	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
−2.00	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
−1.90	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
−1.80	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
−1.70	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
−1.60	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
−1.50	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
−1.40	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
−1.30	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
−1.20	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
−1.10	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
−1.00	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
−0.90	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
−0.80	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
−0.70	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
−0.60	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
−0.50	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
−0.40	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
−0.30	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
−0.20	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
−0.10	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
−0.00	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

Standard Normal Table

Table Values Represent Area to the Left of the z-score

z^*	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.00	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.10	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.20	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.30	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.40	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.50	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.60	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.70	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.80	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.90	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.00	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.10	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.20	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.30	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.40	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.50	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.60	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.70	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.80	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.90	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.00	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.10	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.20	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.30	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.40	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.50	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.60	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.70	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.80	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.90	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.00	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.10	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.20	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.30	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.40	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.50	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.60	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.70	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.80	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.90	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000