UNIVERSITY AT ALBANY
STATE UNIVERSITY OF NEW YORK

AMAT 108 Elementary Statistics — Exam 2
Fall 2025 — Version 1

Answer Key

Directions: You have **80 minutes** to answer the following questions. ***No notes, textbooks, mobile phones or other aids are allowed. Only scientific calculators are allowed.*** 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.

Do not detach any pages. Please choose your section with a check mark (✓) in the left-most column.

<table>
<tr><th>✓</th><th>Section</th><th>Instructor Name</th><th>Meeting Time</th><th>Meeting Days</th><th>Meeting Location</th></tr>
<tr><td></td><td>4863</td><td>John Habib</td><td>12:00PM</td><td>T/TH</td><td>SS 116</td></tr>
<tr><td></td><td>4465</td><td rowspan="2">Tung Lam</td><td>8:00AM</td><td>M/W</td><td>SS 116</td></tr>
<tr><td></td><td>4713</td><td>9:00AM</td><td>T/TH</td><td>LC 3B</td></tr>
<tr><td></td><td>1712</td><td rowspan="3">James Lamatina</td><td>3:00PM</td><td>M/W</td><td>LC 2</td></tr>
<tr><td></td><td>3749</td><td>10:30AM</td><td rowspan="2">T/TH</td><td>SS 116</td></tr>
<tr><td></td><td>1711</td><td>12:00PM</td><td>LC 1</td></tr>
<tr><td></td><td>1710</td><td rowspan="2">Chris Lange</td><td>3:00PM</td><td rowspan="2">T/TH</td><td rowspan="2">SS 116</td></tr>
<tr><td></td><td>3370</td><td>4:30PM</td></tr>
<tr><td></td><td>5435</td><td>Doug Rosenberg</td><td>3:00PM</td><td>T/TH</td><td>TA 118</td></tr>
<tr><td></td><td>3750</td><td>Sam Spellman</td><td>9:00AM</td><td>T/TH</td><td>SS 116</td></tr>
<tr><td></td><td>3748</td><td>Alea Wittig</td><td>11:40AM</td><td>M/W</td><td>SS 116</td></tr>
</table>

Exam Scoring:

Page	Possible Points	Points Earned
3	7	
4	6	
5	11	
6	8	
7	9	
8	8	
9	6	
Total Points	55	
Percentage		

Questions 1 and 2 are based on the following: Suppose Z has a standard normal distribution.

1. Which of the following equals $P(Z \leq -0.87)$? (1 pt.)

① 0.1894
② 0.2206
③ 0.1922
④ 0.1949
⑤ None of the previous options.

2. Find the closest value of c such that $P(Z \geq c) \approx 0.0281$. (2 pts.)

① 1.91
② 1.90
③ 2.77
④ 1.92
⑤ None of the previous options.

3. Suppose X is a discrete random variable with the probability distribution given below:

X	5	8	13
$P(X)$	0.24		0.37

What is the value of $P(X = 8)$? (2 pts.)

① 0.61
② 0.39
③ 0.24
④ 0.37
⑤ None of the previous options.

4. A random sample of 835 individuals is selected from a population with $p = 0.63$. Is the distribution of $\hat{p}$ approximately normal? (2 pts.)

① Yes, the distribution of $\hat{p}$ is approximately normal because the success-failure conditions $np \geq 10$ and $n(1-p) \geq 10$ are met.

② Yes, the distribution of $\hat{p}$ is approximately normal because one or both of the success-failure conditions $np \geq 10$ and $n(1-p) \geq 10$ are not met.

③ No, the distribution of $\hat{p}$ is not approximately normal because the success-failure conditions $np \geq 10$ and $n(1-p) \geq 10$ are met.

④ No, the distribution of $\hat{p}$ is not approximately normal because one or both of the success-failure conditions $np \geq 10$ and $n(1-p) \geq 10$ are not met.

5. A research scientist finds that the distribution of Final Exam scores (out of 100) in Calculus 1 at SUNY Albany follow a normal distribution with mean 75 and standard deviation 3.7. One student who took the Final Exam in Calculus 1 at SUNY Albany is selected at random.

   (a) Compute the probability that the student scored better (greater) than 83. (3 pts.)

$$P(X \geq 83) = P\left(\frac{X-75}{3.7} \geq \frac{83-75}{3.7}\right) \tag{1}$$
$$\approx P(Z \geq 2.16) \tag{2}$$
$$= 1 - P(Z \leq 2.16) \tag{3}$$
$$\approx 1 - 0.9846 \tag{4}$$
$$= 0.0154 \tag{5}$$

   - $\boxed{+1}$ for "converting to Z", as shown in (1) and (2)
   - $\boxed{+1}$ for (3)
   - $\boxed{+1}$ for (5)

   Note. If the student shows $P(Z \geq 2.16) = P(Z \leq -2.16) \approx 0.0154$, do not deduct any points for (3) and (5).

   (b) Compute the probability that the student scores between 74 and 82. (3 pts.)

$$P(74 \leq X \leq 82) = P\left(\frac{74-75}{3.7} \leq \frac{X-75}{3.7} \leq \frac{82-75}{3.7}\right) \tag{6}$$
$$\approx P(-0.27 \leq Z \leq 1.89) \tag{7}$$
$$= P(Z \leq 1.89) - P(Z \leq -0.27) \tag{8}$$
$$\approx 0.9706 - 0.3936 \tag{9}$$
$$= 0.5770 \tag{10}$$

   - $\boxed{+1}$ for (7)
   - $\boxed{+1}$ for (8)
   - $\boxed{+1}$ for (10)

6. Suppose Y has a uniform distribution on the interval $(3, 23)$.

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

(11) $$f(x) = \frac{1}{23-3} = \frac{1}{20} \quad \longrightarrow \quad \text{height} = \frac{1}{20}$$

- $\boxed{+1}$ for showing $23 - 3$ as work
- $\boxed{+1}$ for right-hand side of (11)

(b) Compute $P(Y \le 6)$. (3 pts.)

(12) $$P(Y \le 6) = \frac{1}{20}(6-3)$$

(13) $$= 0.15$$

- $\boxed{+1}$ for base of $6 - 3$
- $\boxed{+1}$ for multiplying base by height
- $\boxed{+1}$ for (13)

Note. If the student states the base is 6 and $P(Y \le 6) = 0.3$, deduct one point.

(c) Compute $P(Y \ge 15)$. (3 pts.)

(14) $$P(Y \ge 15) = \frac{1}{20}(23-15)$$

(15) $$= 0.4$$

- $\boxed{+1}$ for base of $23 - 15$
- $\boxed{+1}$ for multiplying base by height
- $\boxed{+1}$ for (15)

Note. If the student states the base is either 12 or 15 and gives a probability of either 0.6 or 0.75, respectively, deduct one point.

(d) Compute $P(12 < Y < 21)$. (3 pts.)

(16) $$P(12 < Y < 21) = \frac{1}{20}(21-12)$$

(17) $$= 0.45$$

- $\boxed{+1}$ for base of $21 - 12$
- $\boxed{+1}$ for multiplying base by height
- $\boxed{+1}$ for (17)

7. A biased coin is flipped twice. The coin is biased in such a way that the probability of heads appearing facing upwards equals 70%. With X being the (discrete) random variable equal to the number of times the coin lands heads facing upwards, the probability distribution of X is given below:

X	0	1	2
$P(X)$	0.09	0.42	0.49

(a) Compute the mean (expected) value of X. Do *not* round your answer. (3 pts.)

$$\mu = 0(0.09) + 1(0.42) + 2(0.49) \tag{18}$$
$$= 0 + 0.42 + 0.98 \tag{19}$$
$$= 1.4 \tag{20}$$

- $\boxed{+1}$ for multiplying each possible value by associated probabilities
- $\boxed{+1}$ for adding products together
- $\boxed{+1}$ for (20)
- $\boxed{-2}$ if the student shows

$$\mu = \frac{0 + 1 + 2}{3} \tag{21}$$
$$= 1 \tag{22}$$

- $\boxed{-3}$ if the student shows

$$\mu = \frac{0.09 + 0.42 + 0.49}{3} \tag{23}$$
$$\approx 0.333 \tag{24}$$

(b) Compute the standard deviation of X. Round your answer to *three* decimal places. (5 pts.)

$$\sigma = \sqrt{0.09(0 - 1.4)^2 + 0.42(1 - 1.4)^2 + 0.49(2 - 1.4)^2} \tag{25}$$
$$\approx 0.648 \tag{26}$$

- $\boxed{+1}$ for showing all squared deviations from mean
- $\boxed{+1}$ for multiplying squared deviations by associated probabilities
- $\boxed{+1}$ for adding products together
- $\boxed{+1}$ for taking square root
- $\boxed{+1}$ for (26) with correct rounding

8. A recent report claims that 9% of all American adults have Type 1 diabetes. Believing that this report is overstating the number of American adults who actually have the disease, a doctor selects 14925 American adults at random and asks each of them whether they have Type 1 diabetes. *Assume that the success-failure conditions for $\hat{p}$ to have an approximate normal distribution are satisfied, since* $np = 1343.25$ *and* $n(1-p) = 13581.75$.

(a) Which of the following is equal to the mean (expected) value of the distribution of $\hat{p}$? (1 pt.)

① 0.91
② 0.09 (filled)
③ 0.11
④ 0.0819
⑤ None of the previous options.

(b) Compute the standard deviation of the distribution of $\hat{p}$. Round your answer to *five* decimal places. (3 pts.)

(27) $$\sigma_{\hat{p}} = \sqrt{\frac{0.09(1-0.09)}{14925}}$$

(28) $$\approx 0.00234$$

- $\boxed{+1}$ for fraction inside square root as in (27) (must be completely correct; no partial credit otherwise)
- $\boxed{+1}$ for taking square root as in (27)
- $\boxed{+1}$ for (28) with correct rounding

(c) The doctor finds that 9.62% of the 14925 American adults surveyed have Type 1 diabetes. Use your answers in (a) and (b) above to compute the z-score for this sample proportion. Round your answer to *two* decimal places. (3 pts.)

(29) $$z = \frac{0.0962 - 0.09}{0.00234}$$

(30) $$\approx 2.65$$

- $\boxed{+1}$ for numerator in (29)
- $\boxed{+1}$ for denominator in (29)
- $\boxed{+1}$ for (30) with correct rounding

(d) Use your answer to (c) above to compute the probability that at least 9.62% of all American adults have Type 1 diabetes. *Hint:* Find $P(\hat{p} \geq 0.0962)$. (2 pts.)

(31) $$P(\hat{p} \geq 0.0962) \approx P(Z \geq 2.65)$$

(32) $$= 1 - P(Z \leq 2.65)$$

(33) $$\approx 1 - 0.9960$$

(34) $$= 0.0040$$

- $\boxed{+1}$ for (31)
- $\boxed{+1}$ for (34)

Note. If the student replaces (32) and (33) with $P(Z \leq -2.65)$, do not deduct any credit.

9. The Math Department at SUNY Albany claims that students taking statistics score, on average, 15 percentage points higher on Exam 2 than on Exam 1, with a standard deviation of 8.9 percentage points. The statistics instructors dispute this claim, thinking that students are not improving their score as much as the Department claims. To test this, the instructors select a random sample of 8463 statistics students and compare their performance on Exam 1 and Exam 2.

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

   ① Yes, because the population of interest has a normal distribution.

   ❷ No, but $\overline{X}$ has an approximate normal distribution because the sample size is sufficently large.

   ③ No, and we cannot conclude anything about the distribution of $\overline{X}$.

   (b) Which of the following is equal to the mean (expected) value of the distribution of $\overline{X}$? (1 pt.)

   ❶ 15

   ② 8463

   ③ 108

   ④ 8.9

   ⑤ None of the previous options.

   (c) Compute the standard deviation of the distribution of $\overline{X}$. Round your answer to *four* decimal places. (3 pts.)

(35) $$\sigma_{\overline{X}} = \frac{8.9}{\sqrt{8463}}$$

(36) $$\approx 0.0967$$

- +1 for numerator in (35)
- +1 for denominator in (35) including square root (no partial credit)
- +1 for (36) with correct rounding

   (d) The 8463 statistics students selected are found to have averaged 14.75 percentage points higher on Exam 2 than on Exam 1. Use your answers in (b) and (c) above to compute the z-score for this sample mean. (3 pts.)

(37) $$z = \frac{14.75 - 15}{0.0967}$$

(38) $$\approx -2.59$$

- +1 for numerator in (37)
- +1 for denominator in (37)
- +1 for (38) with correct rounding

(e) Use your answer to (c) on the previous page to compute the probability that statistics students, on average, score no more than 14.75 percentage points higher on Exam 2 than on Exam 1. *Hint:* Compute $P(\overline{X} \leq 14.75)$. (2 pts.)

(39) $$P(\overline{X} \leq 14.75) = P(Z \leq -2.59)$$
(40) $$\approx 0.0048$$

- +1 for (39)
- +1 for (40)

(f) Compute $P(14.75 \leq \overline{X} \leq 15.25)$. *Hint:* This is a symmetric-limits problem. (4 pts.) **If the student calculates the probability using the standard method. . .**

(41) $$P(14.75 \leq \overline{X} \leq 15.25) \approx P\left(-2.59 \leq Z \leq \frac{15.25 - 15}{0.0967}\right)$$
(42) $$\approx P(-2.59 \leq Z \leq 2.59)$$
(43) $$= P(Z \leq 2.59) - P(Z \leq -2.59)$$
(44) $$\approx 0.9952 - 0.0048$$
(45) $$= 0.9904$$

- +1 for (41)
- +1 for (43)
- +1 for (44)
- +1 for (45)

If the student uses the properties of symmetric-limits problems. . .

(46) $$P(14.75 \leq \overline{X} \leq 15.25) \approx P(-2.59 \leq Z \leq 2.59)$$
(47) $$= 1 - 2P(Z \leq -2.59)$$
(48) $$\approx 1 - 2(0.0048)$$
(49) $$= 0.9904$$

- +1 for (46)
- +1 for (47)
- +1 for (48)
- +1 for (49)

Note. Pay careful attention to which method the student uses to answer this question.

Formula Sheet:

- 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 · Height

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

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

- Standardized variable (z-score) for X when σ known:

$$Z = \frac{X - \mu}{\sigma}$$

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

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

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 $\hat{p}$:

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

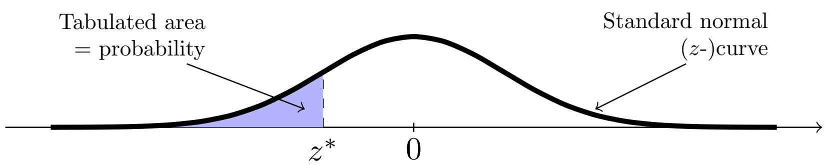
- Standardized variable (z-score) for $\hat{p}$:

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

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

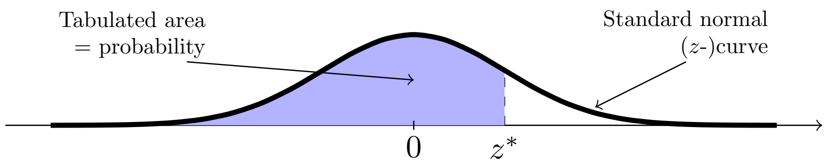
$$np \geq 10 \qquad n(1-p) \geq 10$$

Standard Normal Table



z^*	**0.00**	**0.01**	**0.02**	**0.03**	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.09**
-3.9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
-3.8	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.6	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

Standard Normal Table



z^*	**0.00**	**0.01**	**0.02**	**0.03**	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.09**
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000