



Please note that the 2007/08 exams for this course will follow the content and the format of the Sample Examination for 2007/08. The following exam is for reference only and is not necessarily representative of the exams for the 2007/08 school year.

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BRITISH
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Principles of Mathematics 12

April 2004

Course Code = MA

Student Instructions

1. Place the stickers with your Personal Education Number (PEN) in the allotted spaces above. **Under no circumstance is your name or identification, other than your Personal Education Number, to appear on this booklet.**
2. Ensure that in addition to this examination booklet, you have an **Examination Response Form**. Follow the directions on the front of the Response Form.
3. **Disqualification** from the examination will result if you bring books, paper, notes or unauthorized electronic devices into the examination room.
4. When instructed to open this booklet, **check the numbering of the pages** to ensure that they are numbered in sequence from page one to the last page, which is identified by **END OF EXAMINATION**.
5. At the end of the examination, place your Response Form inside the front cover of this booklet and return the booklet and your Response Form to the supervisor.

Question 1									
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Question 4a									
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Question 4b									
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Question 5									
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Question 6b									
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PRINCIPLES OF MATHEMATICS 12

April 2004

COURSE CODE = MA

GENERAL INSTRUCTIONS

1. Aside from an approved calculator, electronic devices, including dictionaries and pagers, are **not** permitted in the examination room.
2. All multiple-choice answers must be entered on the Response Form using an **HB pencil**. Multiple-choice answers entered in this examination booklet will **not** be marked.
3. For each of the written-response questions, write your answer in the space provided in this booklet. Rough-work space has been incorporated into the space allowed for answering each written-response question. You may not need all of the space provided to answer each question.
4. Ensure that you use language and content appropriate to the purpose and audience of this examination. Failure to comply may result in your paper being awarded a zero.
5. This examination is designed to be completed in **two hours**. *Students may, however, take up to 30 minutes of additional time to finish.*

PRINCIPLES OF MATHEMATICS 12 PROVINCIAL EXAMINATION

- | | Value | Suggested Time |
|---|-----------------|--------------------|
| 1. This examination consists of two parts: | | |
| PART A: 40 multiple-choice questions | 60 marks | 75 minutes |
| PART B: 7 written-response questions | 30 marks | 45 minutes |
| Total: | 90 marks | 120 minutes |
2. The last **four** pages inside the back cover contain **A Summary of Basic Identities and Formulae, The Standard Normal Distribution Table, Rough Work for Graphing, and Rough Work for Multiple-Choice**. These pages may be detached for convenient reference prior to writing this examination.
3. **A graphing calculator is essential for the Principles of Mathematics 12 Provincial Examination.** The calculator must be a hand-held device designed primarily for mathematical computations involving logarithmic and trigonometric functions, for graphing functions and for performing statistical tests. Computers, calculators with a QWERTY keyboard or symbolic manipulation abilities such as the Computer Algebraic System (CAS) and electronic writing pads will not be allowed. Students must not bring any external devices (peripherals) to support calculators such as manuals, printed or electronic cards, printers, memory expansion chips or cards, CD-ROMs, libraries or external keyboards. Students may have more than one calculator available during the examination, of which one may be a scientific calculator. Calculators may not be shared and must not have the ability to either transmit or receive electronic signals. In addition to an approved calculator, students will be allowed to use rulers, compasses, and protractors during the examination.
- Calculators must not have any information programmed into the memory which would not be acceptable in paper form.* Specifically, calculators must not have any built-in notes, definitions, or libraries. There is no requirement to clear memories at the beginning of the examination but the use of calculators with built-in notes is equivalent to the use of notes in paper form. Any student deemed to have cheated on a provincial examination will receive a “0” on that examination and will be permanently disqualified from the Provincial Examination Scholarship Program.
4. If, in a justification, you refer to information produced by the graphing calculator, this information must be presented clearly in the response. For example, if a graph is used in the solution of the problem it is important to sketch the graph, showing its general shape and indicating the appropriate values. If the statistical features of the calculator are used, it is important to show the function with the substitution of the relevant numbers. For example: in part of the solution it is acceptable to show $\text{normalcdf}(10, 40, 50, 20)$ or the equivalent syntax for the calculator used.
5. When using the calculator, you should provide a decimal answer that is correct to **at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

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PART A: MULTIPLE CHOICE

Value: 60 marks

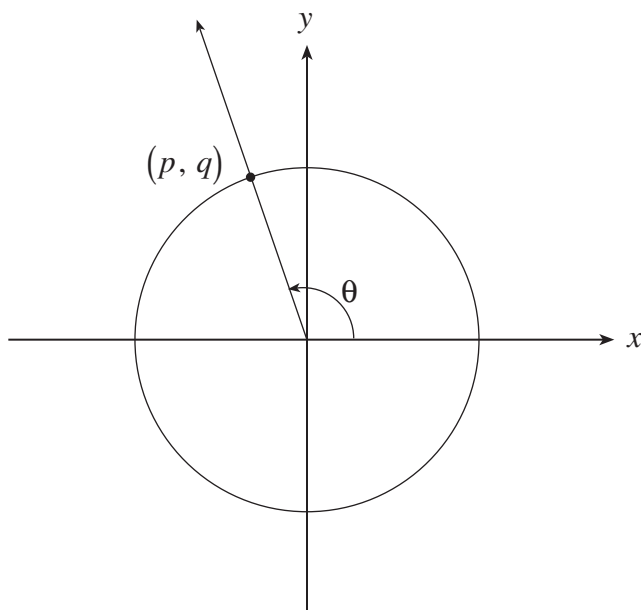
Suggested Time: 75 minutes

INSTRUCTIONS: For each question, select the **best** answer and record your choice on the Response Form provided. Using an HB pencil, completely fill in the circle on the Response Form that has the letter corresponding to your answer.

1. Convert 200 degrees to radians.

- A. $\frac{10\pi}{9}$
- B. $\frac{9\pi}{10}$
- C. $\frac{9\pi}{5}$
- D. $\frac{5\pi}{9}$

2. The point (p, q) is the point of intersection of the terminal arm of angle θ in standard position and the unit circle centred at $(0, 0)$ as shown in the diagram. Which expression represents $\tan \theta$?



- A. p
- B. q
- C. $\frac{p}{q}$
- D. $\frac{q}{p}$

3. Evaluate: $\csc \frac{5\pi}{3}$

A. -2

B. $\frac{-2}{\sqrt{3}}$

C. $\frac{2}{\sqrt{3}}$

D. 2

4. State the phase shift of the function:

$$y = -\cos\left(4x - \frac{\pi}{2}\right)$$

A. $\frac{\pi}{8}$ to the right

B. $\frac{\pi}{8}$ to the left

C. $\frac{\pi}{2}$ to the right

D. $\frac{\pi}{2}$ to the left

5. A pendulum 15 cm long swings through an arc of length 30 cm. Through what angle does the pendulum swing? (Answer accurate to the nearest degree.)

A. 2°

B. 60°

C. 75°

D. 115°

6. Solve: $2 \cos^2 x - \cos x - 1 = 0$, $0 \leq x < 2\pi$

A. $x = 0, \frac{5\pi}{6}, \frac{7\pi}{6}$

B. $x = 0, \frac{2\pi}{3}, \frac{4\pi}{3}$

C. $x = \frac{\pi}{6}, \pi, \frac{11\pi}{6}$

D. $x = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$

7. Determine all restrictions for the expression: $\frac{\sin x}{\cos x(2 \cos x - 1)}$

- A. $\cos x \neq 0, \cos x \neq \frac{1}{2}$
- B. $\cos x \neq 0, \cos x \neq -\frac{1}{2}$
- C. $\sin x \neq 0, \cos x \neq 0, \cos x \neq \frac{1}{2}$
- D. $\sin x \neq 0, \cos x \neq 0, \cos x \neq -\frac{1}{2}$

8. Simplify: $\sin(\pi + x) - \sin(\pi - x)$

- A. $-2 \cos x$
- B. $-2 \sin x$
- C. $2 \cos x$
- D. $2 \sin x$

9. Evaluate: $\sum_{k=1}^4 \cos \frac{k\pi}{4}$

- A. -1
- B. 0
- C. 1
- D. $\frac{4}{\sqrt{2}}$

10. Determine an expression for the number of terms in the series:

$$\sum_{k=a}^b 5(3)^{k-1}$$

- A. b
- B. $b - a$
- C. $b - a + 1$
- D. $b - a - 1$

OVER

11. Determine the sum of the first 12 terms of the geometric series: $-18 + 12 - 8 + \dots$
- A. -941.37
 - B. -10.88
 - C. -10.72
 - D. 926.97
12. In a geometric sequence, $t_4 = -192$ and $t_7 = 12\,288$. Determine the first term.
- A. -4
 - B. -3
 - C. 3
 - D. 4
13. A shoe store is closing and wants to sell all of its shoes. At the start of each week, the price of all shoes is reduced by 10% of the current price. If a pair of shoes costs \$100 during the first week of the sale, determine the price of these shoes during the 6th week of the sale.
- A. \$50.00
 - B. \$53.14
 - C. \$59.05
 - D. \$65.61
14. Determine the common ratio of the infinite geometric sequence:

$$\log_3 a, \log_9 a, \log_{81} a, \dots, \text{ where } a > 0$$

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. 2
- D. 3

15. Change $a = \log_3 b$ to exponential form.

- A. $a = b^3$
- B. $a = 3^b$
- C. $b = a^3$
- D. $b = 3^a$

16. Solve for x : $32^{x-1} = 8^{3x-1}$

- A. -2
- B. $-\frac{1}{2}$
- C. $\frac{1}{2}$
- D. 2

17. An earthquake in Vancouver measured 3.2 on the Richter scale and an earthquake in San Francisco measured 5.1. How many times as intense was the earthquake in San Francisco compared to the earthquake in Vancouver?

- A. 1.59
- B. 1.90
- C. 38.90
- D. 79.43

18. If a radioactive substance decays from 100 g to 30 g in 12 years, which equation below could be used to determine the half-life, N years, of the substance?

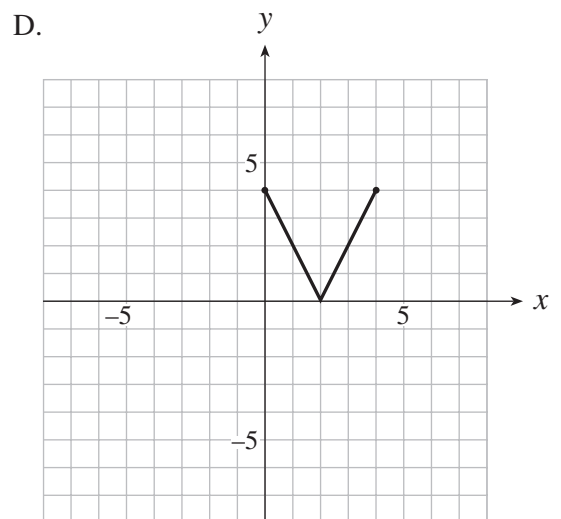
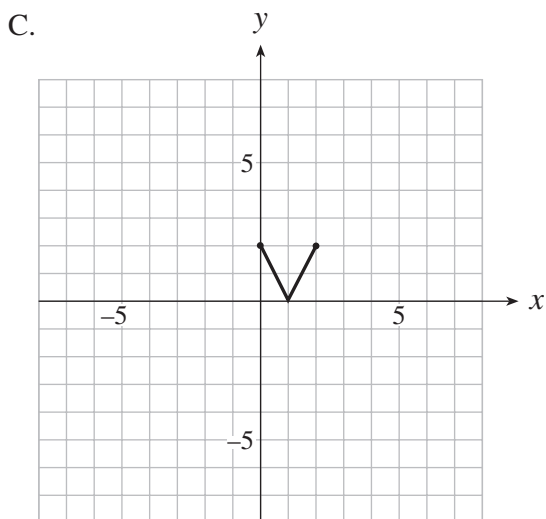
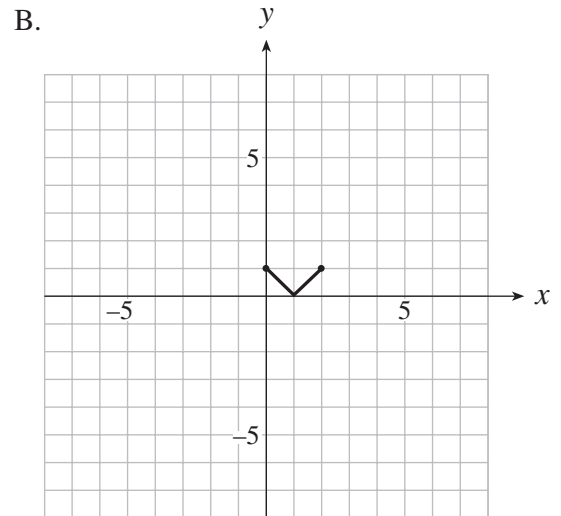
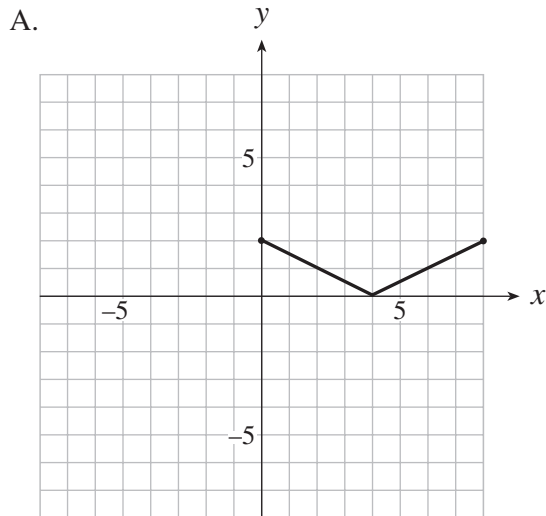
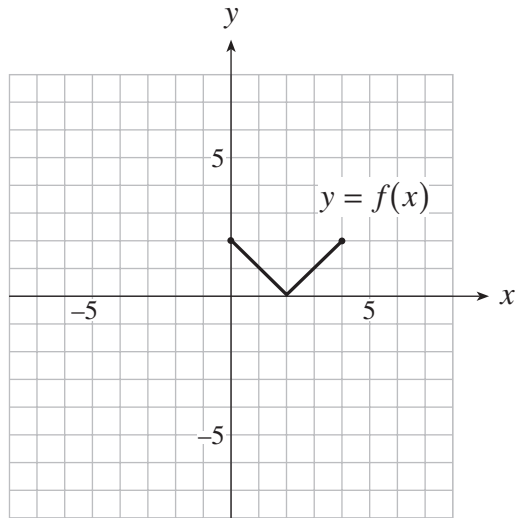
- A. $100 = 30\left(\frac{1}{2}\right)^{\frac{N}{12}}$
- B. $100 = 30\left(\frac{1}{2}\right)^{\frac{12}{N}}$
- C. $30 = 100\left(\frac{1}{2}\right)^{\frac{N}{12}}$
- D. $30 = 100\left(\frac{1}{2}\right)^{\frac{12}{N}}$

OVER

19. If $\log_5 x = 25$, determine the value of $\log_5\left(\frac{x}{25}\right)$.
- A. 0
 - B. 1
 - C. 20
 - D. 23
20. Solve for x : $\log(3-x) + \log(3+x) = \log 5$
- A. $x = -2$
 - B. $x = 2$
 - C. $x = \pm 2$
 - D. no solution
21. Determine the domain of the function $y = \log_x(8-x)$.
- A. $x < 8$
 - B. $x < 8, x \neq 1$
 - C. $0 < x < 8$
 - D. $0 < x < 8, x \neq 1$
22. If the intersection of a plane and a double-napped cone forms a circle, then the plane must be
- A. perpendicular to the generator of the cone.
 - B. parallel to the generator of the cone.
 - C. perpendicular to the central axis of the cone.
 - D. parallel to the central axis of the cone.

23. A rectangular hyperbola with centre $(0, 0)$ has one vertex at $(2, 0)$. Determine an equation of this hyperbola.
- A. $x^2 - y^2 = -4$
 - B. $x^2 - y^2 = 4$
 - C. $x^2 - y^2 = -2$
 - D. $x^2 - y^2 = 2$
24. If $Ax^2 + By^2 = 1$ is an ellipse with its major axis on the x -axis, determine the length of the major axis.
- A. $2A^2$
 - B. $2\sqrt{A}$
 - C. $\frac{2}{A^2}$
 - D. $\frac{2}{\sqrt{A}}$
25. If the point $(-4, -3)$ is on the graph of the function $y = f(x)$, which point must be on the graph of the function $y = |f(x)|$?
- A. $(-4, -3)$
 - B. $(-4, 3)$
 - C. $(4, -3)$
 - D. $(4, 3)$

26. The graph of $y = f(x)$ is shown below. Determine the graph of the function $y = f\left(\frac{1}{2}x\right)$.



27. The relation $x = \sqrt{9 - y^2}$ is compressed vertically by a factor of $\frac{1}{3}$, then translated 1 unit to the right. Determine the equation of the transformed relation.

A. $x = \sqrt{9 - 9y^2} + 1$

B. $x = \sqrt{9 - 9y^2} - 1$

C. $x = \sqrt{9 - \frac{y^2}{9}} + 1$

D. $x = \sqrt{9 - \frac{y^2}{9}} - 1$

28. The zeros of the function $y = f(x)$ are -4 , 1 and 2 . Determine the zeros of the new function $y = -f(x - 1)$.

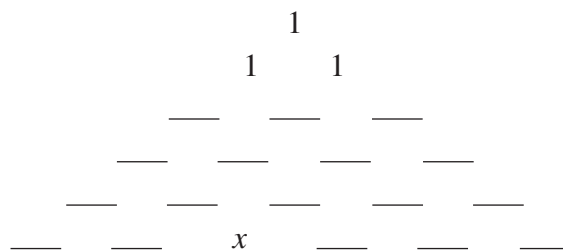
A. $-5, 0, 1$

B. $-3, -2, 3$

C. $-3, 2, 3$

D. $-1, 0, 5$

29. Given Pascal's triangle below, which of the following is equivalent to the value of x ?



A. ${}_4C_2$

B. ${}_5C_2$

C. ${}_6C_2$

D. ${}_6C_3$

30. Determine the number of different arrangements of the letters in the word NANAIMO.

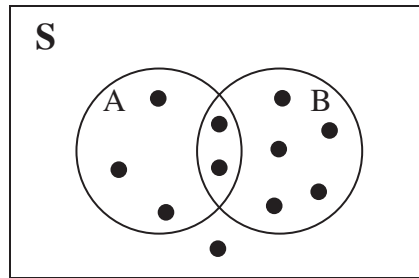
- A. 210
- B. 1260
- C. 2520
- D. 5040

31. A fair coin is tossed 30 times. Which expression gives the probability of obtaining exactly 15 heads in the 30 tosses?

- A. $\frac{1}{2}$
- B. $\left(\frac{1}{2}\right)^{15}$
- C. ${}_{30}C_{15}\left(\frac{1}{2}\right)^{15}$
- D. ${}_{30}C_{15}\left(\frac{1}{2}\right)^{30}$

Use the following diagram to answer questions 32 and 33.

The diagram shows the sample space S of 11 equally likely outcomes.



32. Determine $P(\overline{A})$.

- A. $\frac{1}{11}$
- B. $\frac{5}{11}$
- C. $\frac{6}{11}$
- D. $\frac{8}{11}$

33. Determine $P(B|A)$.

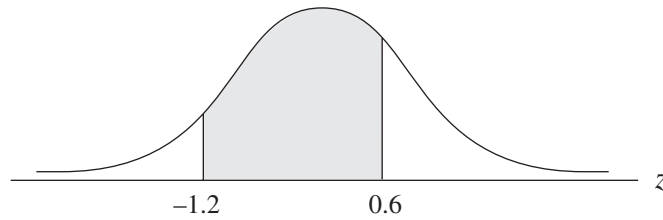
- A. $\frac{2}{11}$
- B. $\frac{2}{7}$
- C. $\frac{2}{5}$
- D. $\frac{7}{11}$

34. It is known that 1% of the population has a certain disease. A test for this disease is 95% accurate. This means that the outcome of the test is correct 95% of the time. What is the probability that a randomly selected person tests negative?
- A. 0.940
 - B. 0.941
 - C. 0.945
 - D. 0.950
35. A fair six-sided die is rolled 60 times. Calculate the mean of the binomial distribution for the number of times a 5 appears.
- A. 10
 - B. 12
 - C. 15
 - D. 30
36. The diameters of oranges are normally distributed with a mean diameter of 9.5 cm and a standard deviation of 0.9 cm. What is the largest diameter that would be less than 88% of the oranges?
- A. 8.4 cm
 - B. 8.5 cm
 - C. 10.5 cm
 - D. 10.6 cm

37. Ten students take a test and their results are listed below. Determine the value of x if the mean score is 76.

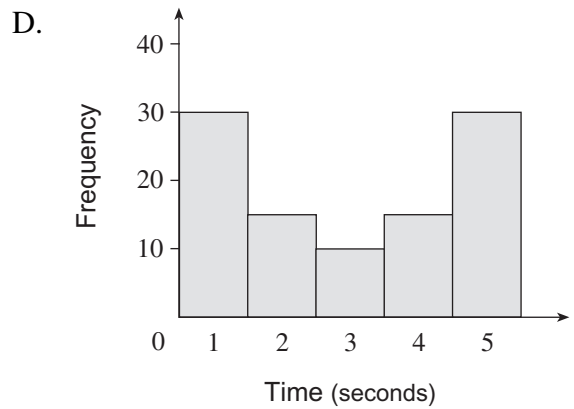
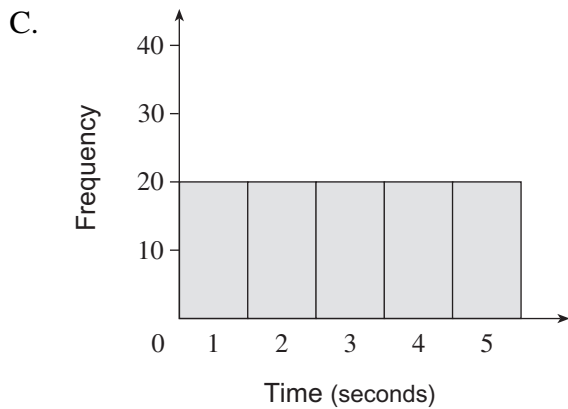
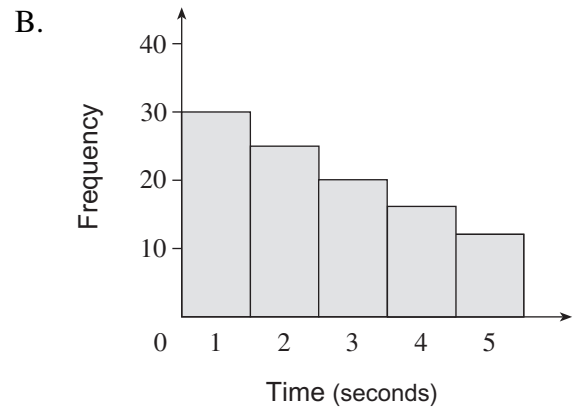
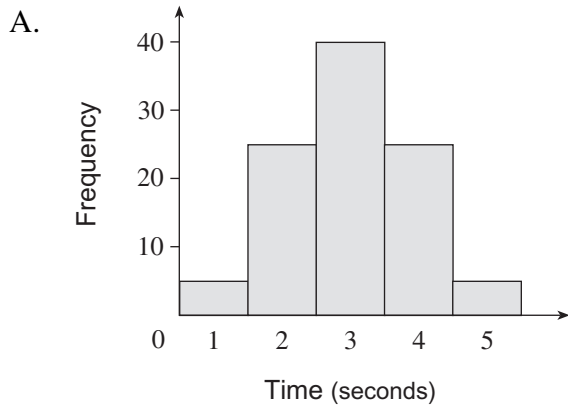
Score	Number of students
45	1
65	2
75	3
x	4

- A. 80
B. 85
C. 90
D. 95
38. Calculate the area of the shaded region under the standard normal curve as shown below.



- A. 0.115
B. 0.274
C. 0.611
D. 0.726

39. Which frequency distribution shows the set of outcomes with the smallest standard deviation?



40. If Z has a standard normal distribution with $P(a < Z < b) = 0.1$, where $-3 < a < b < 3$, which of the following statements must be true?

- A. $P(Z < a) > 0.1$
- B. $P(Z > a) > 0.1$
- C. $P(Z < b) < 0.1$
- D. $P(Z > b) < 0.1$

**This is the end of the multiple-choice section.
Answer the remaining questions directly in this examination booklet.**

PART B: WRITTEN RESPONSE

Value: 30 marks

Suggested Time: 45 minutes

INSTRUCTIONS: Rough-work space has been incorporated into the space allowed for answering each question. You may not need all the space provided to answer each question. Where required, place the final answer for each question in the space provided.

If, in a justification, you refer to information produced by the graphing calculator, this information must be presented clearly in the response. For example, if a graph is used in the solution of the problem it is important to sketch the graph, showing its general shape and indicating the appropriate values. If the statistical features of the calculator are used, it is important to show the function with the substitution of the relevant numbers. For example: in part of the solution it is acceptable to show $\text{normalcdf}(10, 40, 50, 20)$ or the equivalent syntax for the calculator used.

When using the calculator, you should provide a decimal answer that is correct to **at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

Full marks will NOT be given for the final answer only.

1. Solve algebraically: $2 \log_4 x - \log_4(x + 3) = 1$

(5 marks)

ANSWER:

2. The circle with equation $x^2 + 6x + y^2 + 2y = 0$ is translated 2 units to the right to form a new circle. Determine the equation of the new circle and change to standard form. **(4 marks)**

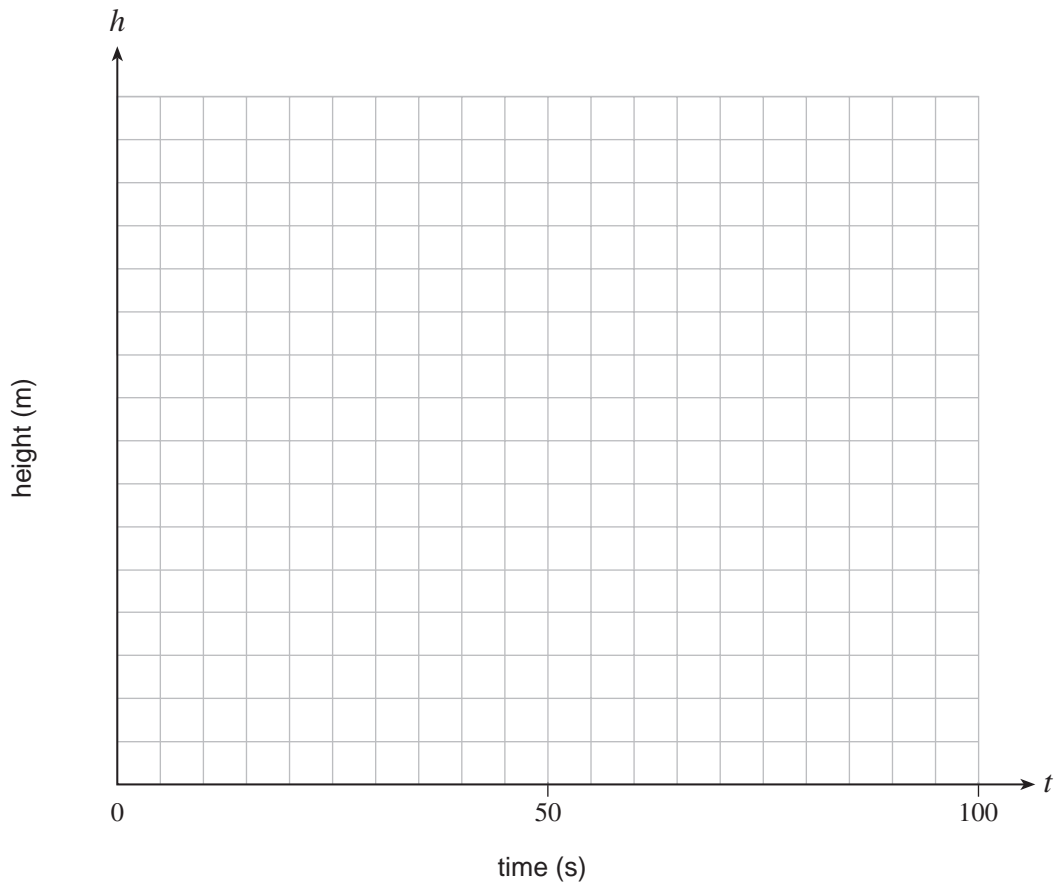
ANSWER:

3. Given the function $f(x) = \frac{3x}{x+1}$, determine the equation of the inverse function $f^{-1}(x)$.

(**Note:** Write the inverse function in the form $f^{-1}(x) = \text{“ } \quad \text{”}$.) **(5 marks)**

ANSWER:

4. A Ferris wheel with a radius of 30 m rotates once every 100 s. At time $t = 0$ s, passengers get on at the lowest point of its rotation which is 5 m above the ground.
- a) Using the grid below, graph how the height h of a passenger varies with respect to the elapsed time t during at least one rotation of the Ferris wheel. Clearly show at least 5 points on your graph and indicate the scale on the vertical axis. **(2 marks)**



- b) Determine a sine function that gives the passenger's height h metres, above the ground as a function of time t seconds. **(2 marks)**

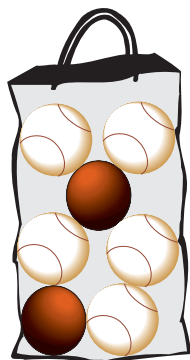
ANSWER:

5. Solve algebraically using factorial notation: ${}_nP_2 = 90$

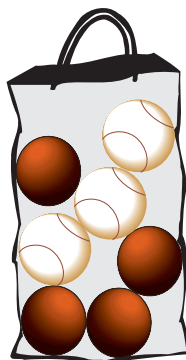
(4 marks)

ANSWER:

6. Bag M contains 5 white balls and 2 red balls. Bag N contains 3 white balls and 4 red balls.



Bag M



Bag N

a) A ball is randomly selected from Bag M and placed in Bag N. A ball is then randomly selected from Bag N. What is the probability that the ball selected from Bag N is white?

(3 marks)

ANSWER:

- b) If a white ball is selected from Bag N, what is the probability that a red ball was transferred from Bag M to Bag N? **(1 mark)**

ANSWER:

OVER

7. Prove the identity:

(4 marks)

$$\tan \theta \cos 2\theta + \tan \theta = \sin 2\theta$$

LEFT SIDE	RIGHT SIDE

END OF EXAMINATION

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A SUMMARY OF BASIC IDENTITIES AND FORMULAE

Pythagorean Identities:

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Reciprocal and Quotient Identities:

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

Addition Identities:

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$$

Double-Angle Identities:

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta$$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$= 2 \cos^2 \theta - 1$$

$$= 1 - 2 \sin^2 \theta$$

Formulae:

$$t_n = ar^{n-1}$$

$$S_n = \frac{a(1-r^n)}{1-r}$$

$$S_n = \frac{a-r\ell}{1-r}$$

$$S = \frac{a}{1-r}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Probability and Statistics:

$${}_n P_r = \frac{n!}{(n-r)!}$$

$${}_n C_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$

$$t_{k+1} = {}_n C_k a^{n-k} b^k$$

$$P(\bar{A}) = 1 - P(A)$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A | B) = \frac{P(A \text{ and } B)}{P(B)}$$

$$P(A \text{ and } B) = P(A) \times P(B | A)$$

$$P(x) = {}_n C_x p^x q^{n-x}$$

$$(q = 1 - p)$$

$$\mu = \frac{\sum x_i}{n}$$

$$\sigma = \sqrt{\frac{\sum (x_i - \mu)^2}{n}}$$

$$\mu = np$$

$$\sigma = \sqrt{npq}$$

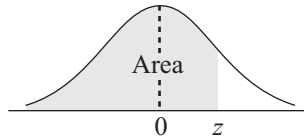
$$z = \frac{x - \mu}{\sigma}$$

Note: Graphing calculators will contain many of these formulae as pre-programmed functions.

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THE STANDARD NORMAL DISTRIBUTION TABLE



$$F_z(z) = P[Z < z]$$

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-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	0.0017	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	0.0352	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	0.0722	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

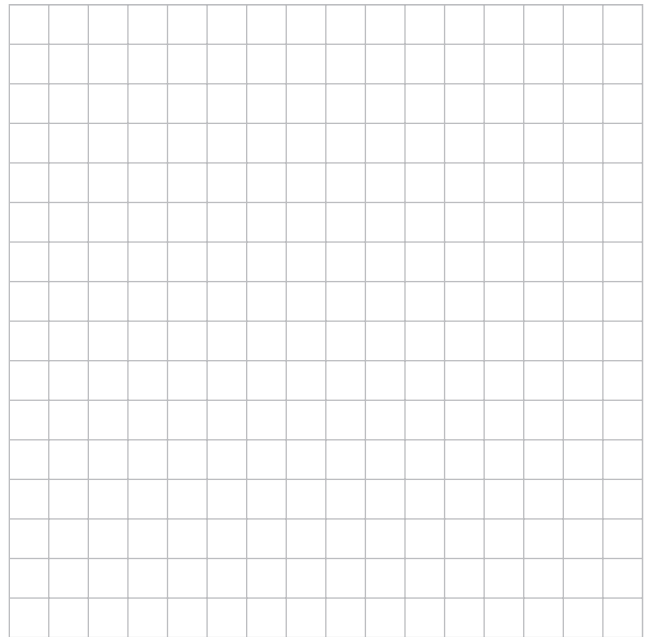
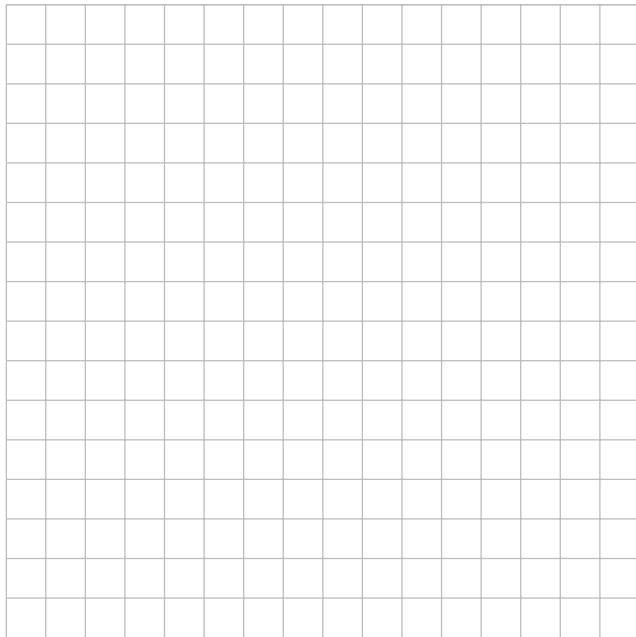
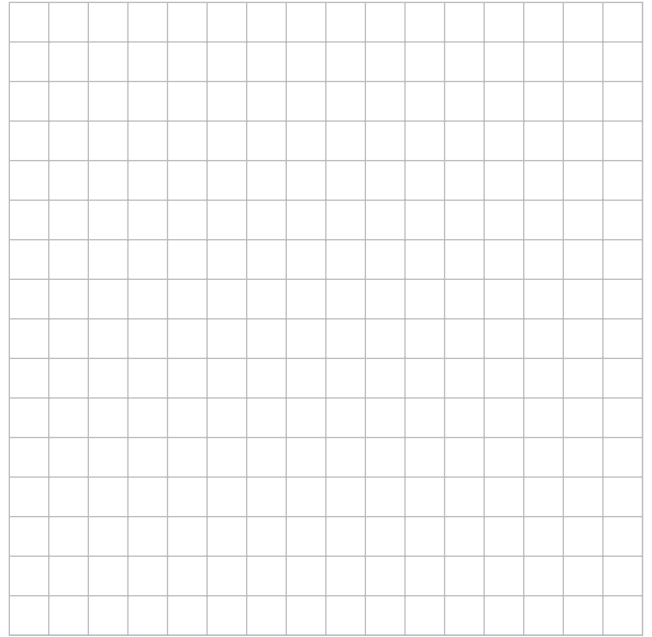
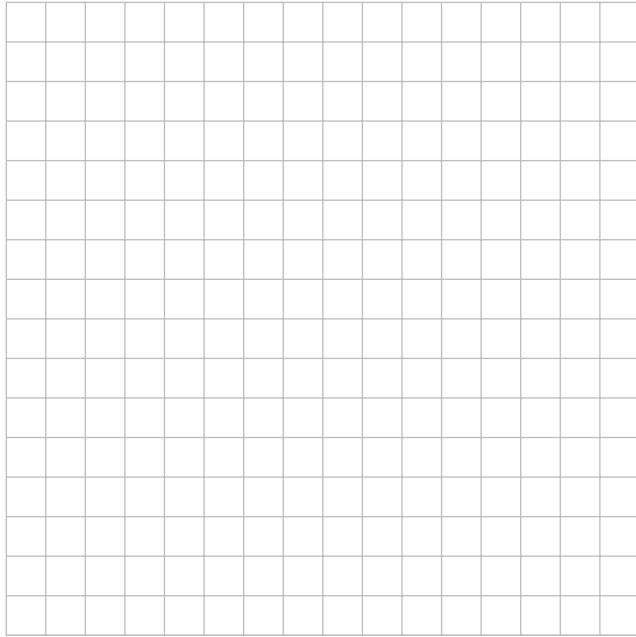
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$$F_z(z) = P[Z < z]$$

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	0.9278	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

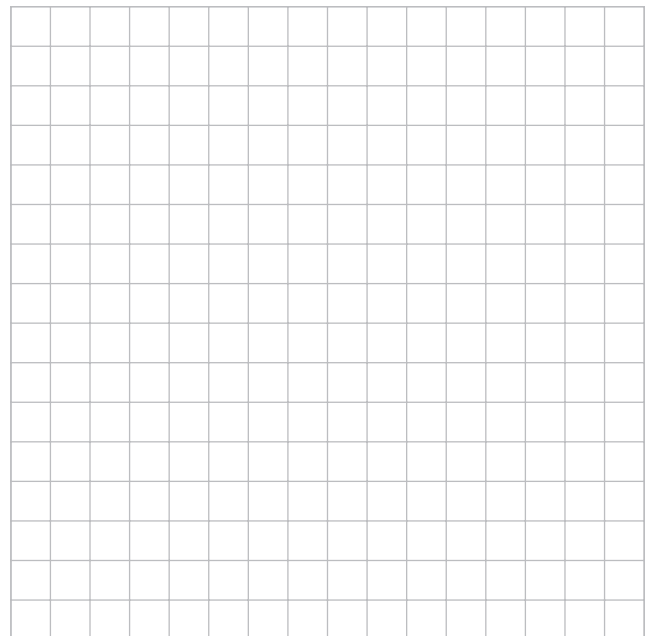
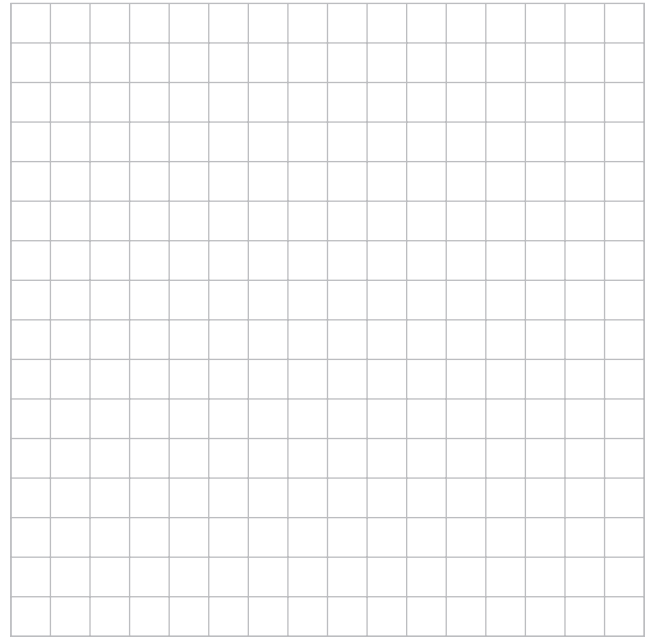
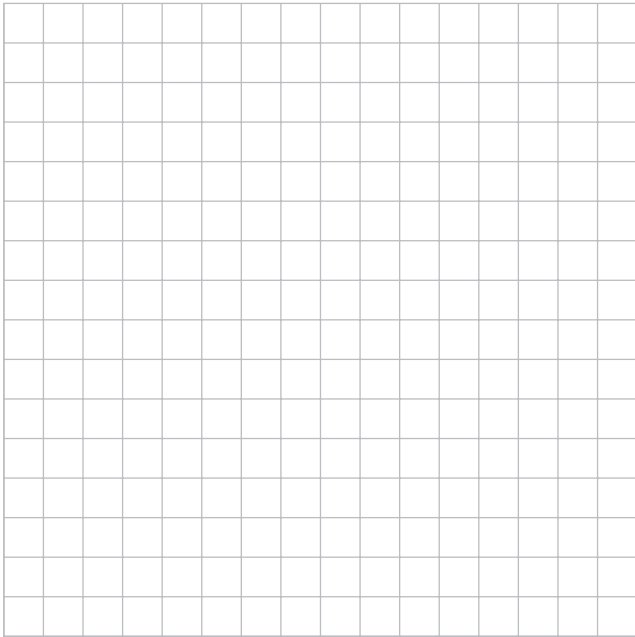
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