

JANUARY 1999

PROVINCIAL EXAMINATION

MINISTRY OF EDUCATION

APPLICATIONS OF MATHEMATICS 12

GENERAL INSTRUCTIONS

1. Insert the stickers with your Student I.D. Number (PEN) in the allotted spaces above and on the **back** cover of this booklet. **Under no circumstance is your name or identification, other than your Student I.D. 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. 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.
5. For each of the written-response questions, write your answer in the space provided in this booklet.
6. 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.

7. 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.

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APPLICATIONS OF MATHEMATICS 12 PROVINCIAL EXAMINATION

- | | Value | Suggested Time |
|---|------------------------|--------------------|
| 1. This examination consists of two parts: | | |
| PART A: 45 multiple-choice questions | 45 | 75 |
| PART B: 8 written-response questions | 25 | 45 |
| | Total: 70 marks | 120 minutes |
- Aside from an approved calculator, electronic devices including dictionaries and pagers are **not** permitted in the examination room.
 - The last **three** pages inside the back cover contain **Formulae, Table of Z-scores, Rough Work for Graphing, and Rough Work for Multiple-Choice**. These pages may be detached for convenient reference prior to writing this examination.
 - You will not be provided with any additional paper since rough-work space for the written-response questions has been incorporated into the space allowed for answering each question. You may not need all of the space provided to answer each question.
 - A graphing calculator is essential for the Applications of Mathematics 12 Provincial Examination.** The calculator must be a hand-held device designed primarily for mathematical computations involving logarithmic and trigonometric functions as well as for graphing functions. Computers, calculators with a QWERTY keyboard, and electronic writing pads will not be allowed. Students must not bring any external devices to support calculators such as manuals, printed or electronic cards, printers, memory expansion chips or cards, 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.
 - If, in a justification, you refer to information produced by the 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 window dimensions.
 - 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.
 - This examination is designed to be completed in **two hours**. Students may, however, take up to **20 minutes** of additional time to finish.

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PART A: MULTIPLE CHOICE

Value: 45 marks

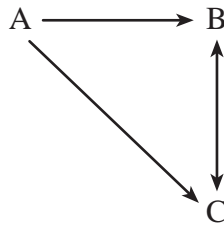
Suggested Time: 75 minutes

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 that has the letter corresponding to your answer.

1. Given matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$, determine the value of a_{21} .

- A. 2
- B. 3
- C. 4
- D. 5

2. Determine a network matrix for the following network diagram:



A.

		To		
		A	B	C
From	A	0	1	1
	B	0	0	1
	C	0	1	0

B.

		To		
		A	B	C
From	A	0	1	1
	B	1	0	1
	C	1	1	0

C.

		To		
		A	B	C
From	A	0	1	1
	B	1	0	1
	C	0	1	0

D.

		To		
		A	B	C
From	A	1	1	1
	B	0	1	1
	C	0	1	1

3. Ray went shopping for candy one day and spent 1 loonie, 2 quarters, 3 dimes and 5 nickels. He wrote his spending as matrix $[1 \ 2 \ 3 \ 5]$. If Ray's spending matrix was $[1 \ 4 \ 0 \ 5]$ the next day, how much did he spend that day?
- A. \$2.05
 - B. \$2.25
 - C. \$2.50
 - D. \$14.05

4. If matrix $A = \begin{bmatrix} 2 & -1 \\ 3 & 1 \end{bmatrix}$ and matrix $B = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$, determine the product BA .

A. $\begin{bmatrix} -3 & -1 \\ -2 & 1 \end{bmatrix}$

B. $\begin{bmatrix} -3 & -2 \\ -1 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & -2 \\ -1 & -3 \end{bmatrix}$

D. $\begin{bmatrix} 1 & -1 \\ -2 & -3 \end{bmatrix}$

5. Solve the following system for x only:

$$2x + 7y + z = 6$$

$$4x - 2z = 6$$

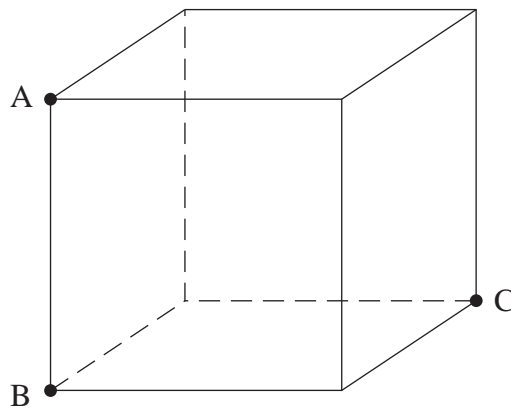
$$4y - z = 6$$

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

6. For a flight matrix, F , which of the following operations would determine how many ways a person could travel between cities with either one or two stopovers?
- A. $F^2 + F^3$
 - B. $F^3 + F^4$
 - C. F^3
 - D. F^4

7. The matrix
- | | | | | |
|---|-----|------------|------------|--|
| | A | B | C | |
| A | 0 | 1 | x | |
| B | 1 | 0 | $\sqrt{2}$ | |
| C | x | $\sqrt{2}$ | 0 | |
- describes the distances between vertices A, B, and C of a

cube with sides of length 1, as shown below.



Determine the value of x .

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

8. A schedule of insurance costs for a certain car is as follows:

Third party liability	\$900
• increased liability (\$1 000 000)	\$150
• increased liability (\$2 000 000)	\$250
Collision (\$200 deductible)	\$450
Comprehensive (\$100 deductible)	\$300

What is the minimum cost for a driver to insure this car with comprehensive coverage (\$100 deductible) if the driver has a 20% safe driver discount?

- A. \$240
- B. \$860
- C. \$960
- D. \$1 320

Use the following spreadsheet to answer question 9.

	A	B	C	D
1	January	April	June	August
2	10	12	18	40
3	5	10	15	20
4	=SUM(A2:D2)	=100*D3/A4	=B3*D2	=A4+C4/B4
5				

9. What value would be calculated for cell B4 ?

- A. 25
- B. 40
- C. 400
- D. 2 000

10. Ken invests his lotto winnings in an account paying 6% annually, compounded monthly. What is the effective (equivalent) annual rate of interest?

- A. 6.09%
- B. 6.17%
- C. 6.5%
- D. 6.83%

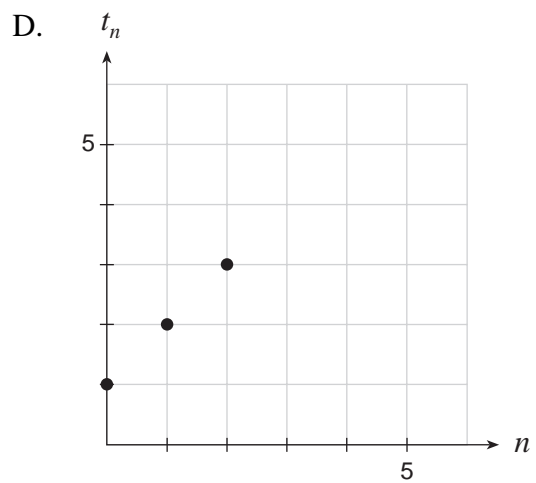
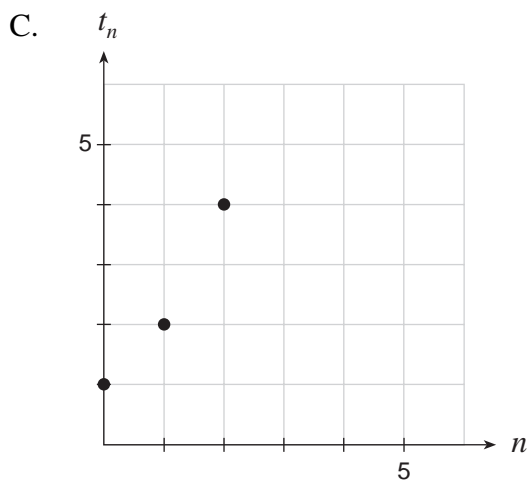
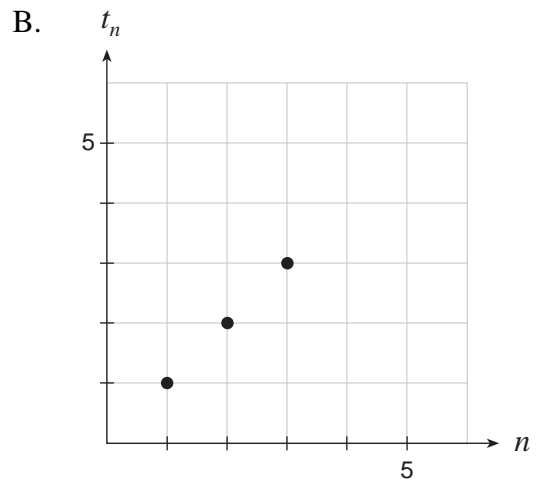
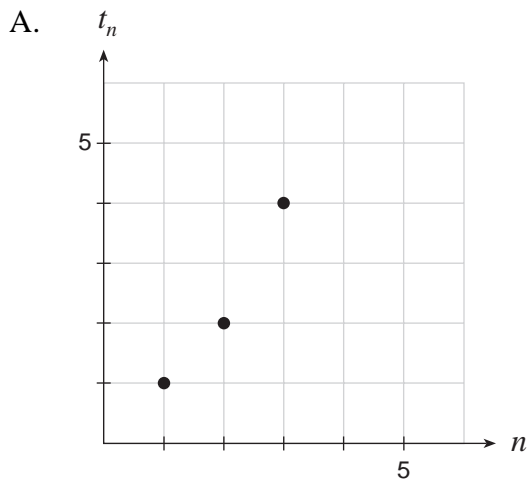
11. Which of the following terms best describes the sequence $t_n = (-1)^n$?

- A. static
- B. divergent
- C. alternating
- D. convergent

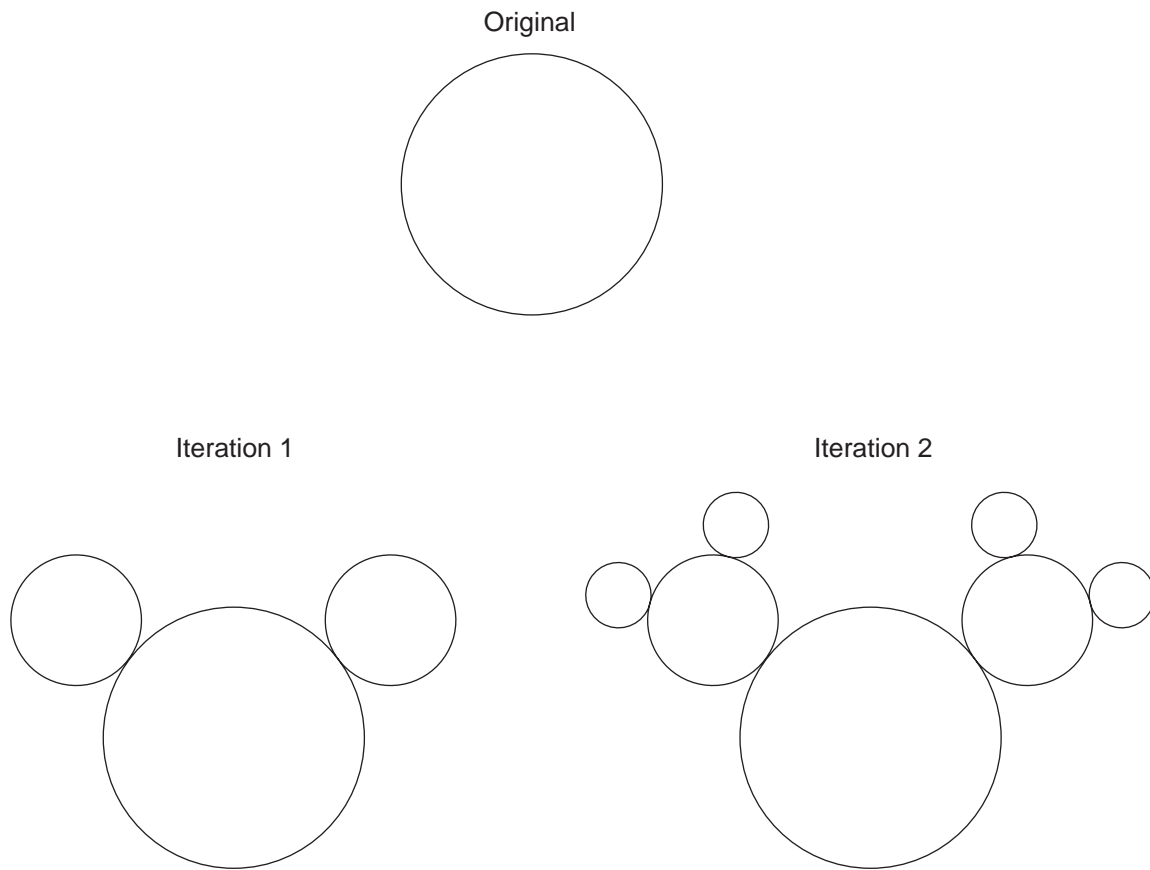
12. Which graph **best** represents the first three terms of a sequence defined by the recursive formula:

$$t_1 = 1$$

$$t_n = 2t_{n-1}, \quad n > 1$$



13. A “Mickey Mouse®” fractal is constructed as shown in the diagrams below. The circles in each successive iteration have radii that are half that of the previous iteration.

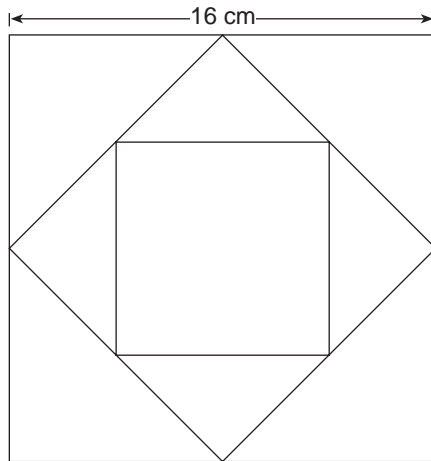


How many circles are in the diagram for iteration 6 ?

- A. 64
- B. 120
- C. 127
- D. 255

14. A fractal is created as follows:

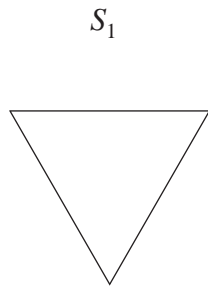
- A square is drawn with sides 16 cm.
- The midpoints of the square are joined.
- The midpoints of the new square are joined.
- This process is continued as illustrated.



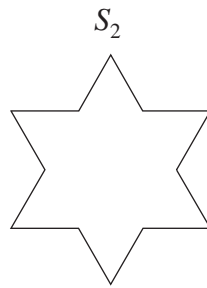
What is the area of the smallest square shown in the diagram above?

- A. 32 cm^2
- B. 64 cm^2
- C. $32\sqrt{2} \text{ cm}^2$
- D. $64\sqrt{2} \text{ cm}^2$

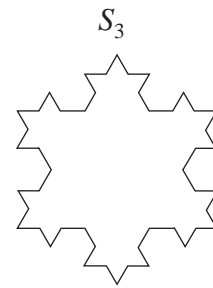
15. The Koch snowflake is constructed as shown in the following diagrams.



S_1 is an equilateral triangle.



To obtain S_2 , construct an equilateral triangle on each side of S_1 and remove the base.

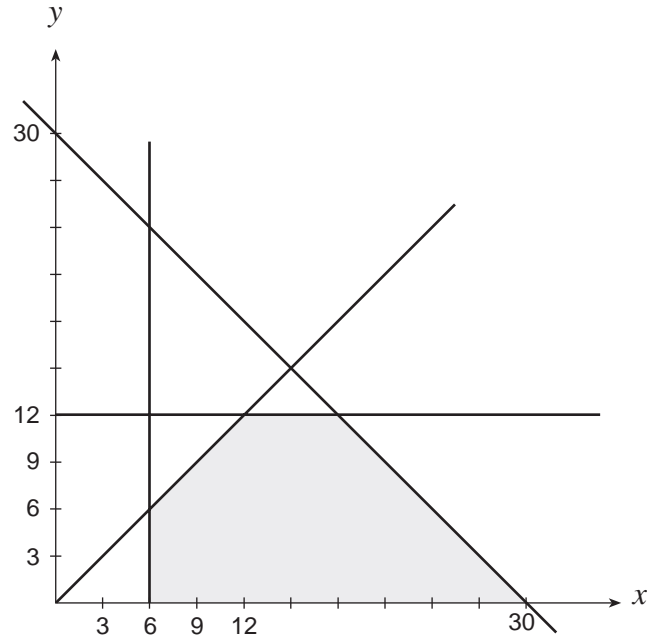


S_3 is obtained from S_2 in the same way as S_2 is obtained from S_1 .

If the perimeter of S_1 is 3, then what is the perimeter of S_3 ?

- A. 4
- B. $\frac{16}{3}$
- C. $\frac{64}{9}$
- D. 16

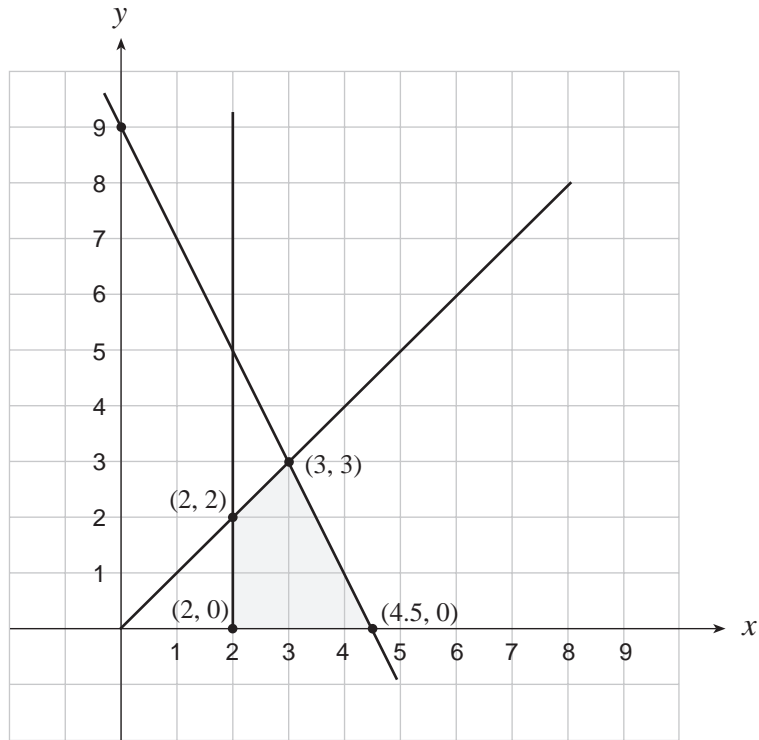
16. The following graph shows the feasible region of a linear programming problem.



How many corner points are there for the feasible region?

- A. 1
- B. 3
- C. 4
- D. 5

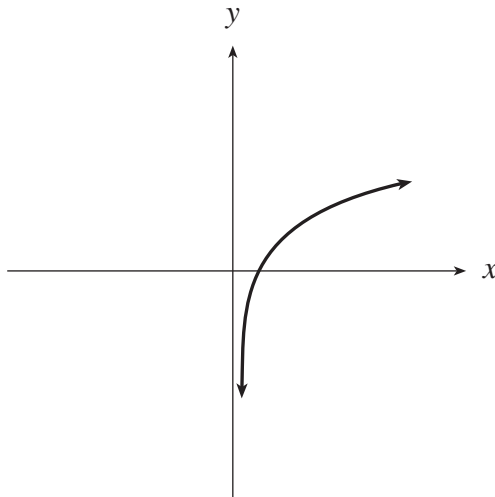
17. A linear programming problem has a feasible region as shown below.



For the objective function $P = 2x - y$, the point $(3, 3)$

- A. minimizes P .
- B. maximizes P .
- C. is not part of the feasible region.
- D. neither maximizes nor minimizes P .

18. Which equation **best** describes the graph shown below?



- A. $y = 2^x$
- B. $y = \left(\frac{1}{2}\right)^x$
- C. $y = \ln x$
- D. $y = -\log x$

19. What are the equations of the asymptotes for the graph of the equation $y = \frac{4}{x+2}$?

- A. $x = 2, y = 2$
- B. $x = 2, y = 0$
- C. $x = -2, y = 2$
- D. $x = -2, y = 0$

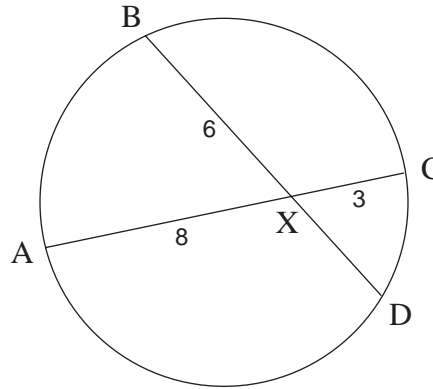
20. Determine the minimum value of the function $f(x) = 6x^3 - 3x^2 - 3x + 6$ in the region where $-1 \leq x \leq 2$.

- A. -1
- B. 0
- C. 0.61
- D. 4.42

21. Determine the period for $y = 2 \sin \frac{1}{2}x$.
- A. $\frac{\pi}{2}$
 - B. π
 - C. 2π
 - D. 4π
22. The path of a carnival ride is described by the function $h = -12 \sin(2\pi t) + 20$. Determine the minimum value of h .
- A. 4
 - B. 8
 - C. 20
 - D. 32
23. At an ocean port on a certain day, the water has a depth of d metres at a time t hours past midnight. This data is modelled by the function $d = 5 \cos\left(\frac{\pi}{6.2}t\right) + 10$. What will be the depth of the water at 9:30 am?
- A. 10.0 m
 - B. 10.5 m
 - C. 12.5 m
 - D. 15.0 m
24. Given $y = \sin x + 2 \cos x + 1$, determine the amplitude. (Accurate to 2 decimal places.)
- A. 2.24
 - B. 3.00
 - C. 3.24
 - D. 4.00

Use the following diagram to answer question 25.

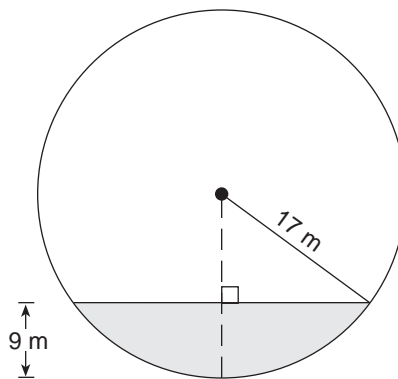
Given: $AX = 8$
 $CX = 3$
 $BX = 6$



25. In the circle above, chords AC and BD intersect at point X. Find XD.

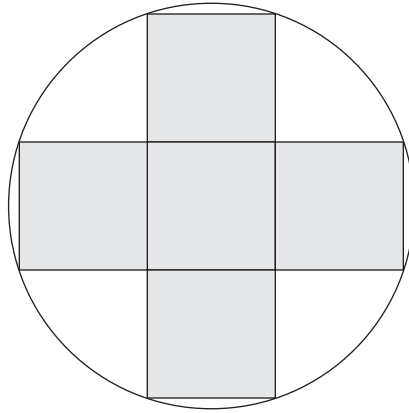
- A. 4
- B. 5
- C. $\frac{4}{3}$
- D. $\frac{9}{4}$

26. In a circular pipe of radius 17 m, the maximum depth of water is 9 m. Find the width, in metres, of the water surface across the pipe.



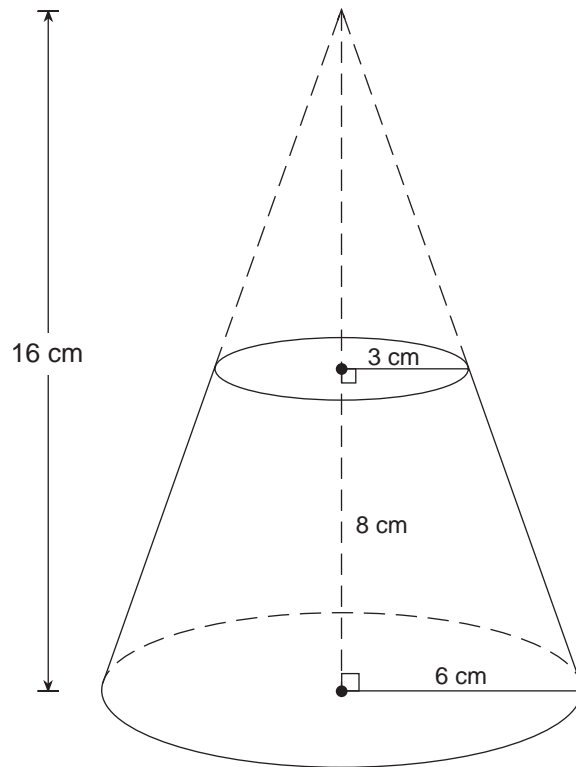
- A. 20
- B. 26
- C. 30
- D. 34

27. A fabric design is based on the diagram shown below. The shaded part consists of 5 congruent squares with sides of length 3 cm. Determine the diameter, in cm, of the circle.



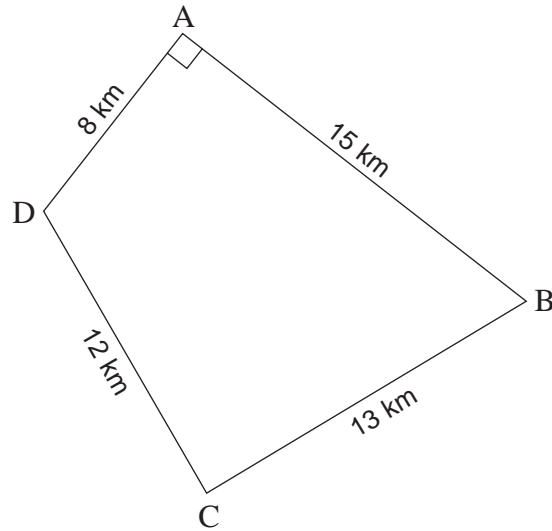
- A. 9.00
- B. 9.49
- C. 10.74
- D. 12.00

28. A cone of height 16 cm has its top cut off (truncated) parallel to its base, as shown in the diagram below. Using the measurements given in the diagram, find the volume of this shape. (Accurate to 2 decimal places.)



- A. 113.10 cm^3
- B. 392.70 cm^3
- C. 527.79 cm^3
- D. 565.49 cm^3

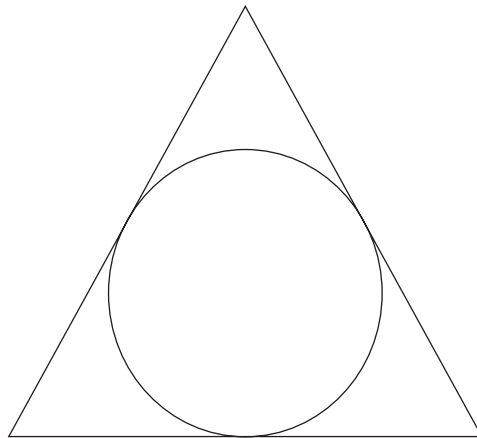
29. A regional park is mapped out in the diagram below.



Find the measure of $\angle DCB$, to the nearest degree.

- A. 81°
- B. 86°
- C. 90°
- D. 94°

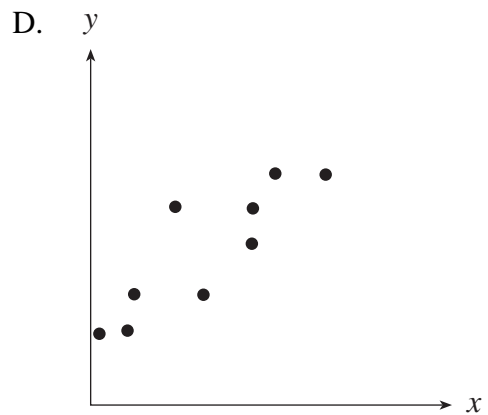
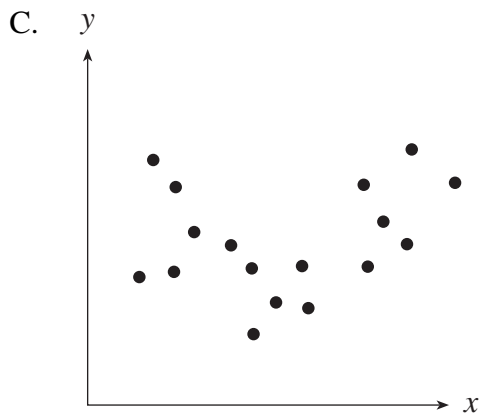
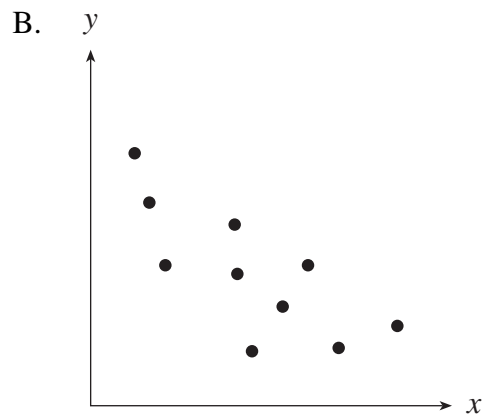
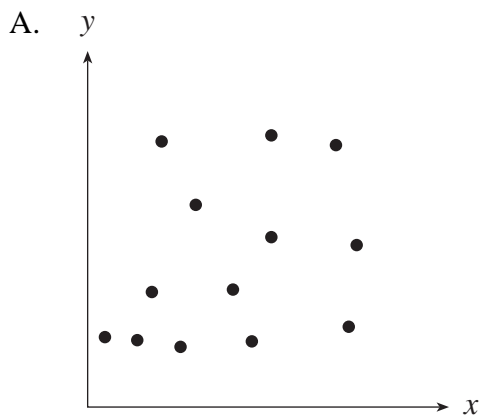
30. In the diagram below, a circle is inscribed in an equilateral triangle with side 8. What is the radius of the inscribed circle?



- A. 2.00
- B. 2.31
- C. 2.83
- D. 4.00

31. A 10 foot ladder is anchored on the floor between two vertical walls of a hallway. When leaning against one wall, the ladder reaches 5 feet up the wall. When flipped over against the opposite wall, the ladder reaches 8 feet up the wall. How far apart are the opposite walls of this hallway?
- A. 11.66 ft
 B. 13.00 ft
 C. 14.66 ft
 D. 15.20 ft

32. Which of the following scatter plots illustrates a correlation coefficient closest to 1 ?



Use the following data to answer questions 33 and 34.

WEIGHT x	SCORES y
100	60
105	20
110	40
90	100

33. Determine the correlation coefficient for the above data.
- A. -0.8857
 - B. -0.7844
 - C. 0.7844
 - D. 0.8857
34. Using the data and the least squares line of best fit, calculate the predicted weight of a person whose score is 70.
- A. 70
 - B. 97
 - C. 140
 - D. 166
35. If the results of an examination are normally distributed, what percentage of scores are within two standard deviations of the mean?
- A. 48%
 - B. 95%
 - C. 97%
 - D. 98%
36. What is the probability that in the toss of four fair coins, two heads and two tails will appear?
- A. $\frac{1}{4}$
 - B. $\frac{3}{8}$
 - C. $\frac{1}{2}$
 - D. $\frac{5}{8}$

37. In a binomial experiment, the probability of success on any one trial is 30% and the number of trials is 20. Assuming a normal distribution, determine the standard deviation.
- A. 1.34
 - B. 1.80
 - C. 2.05
 - D. 4.20
38. Based on previous performance, if a player makes a shot from the free throw line in practice, there is a 70% chance he will make the next shot. The chance of making a free throw after a miss is 80%. What is the chance of making three free throws in a row after missing one?
- A. 34%
 - B. 39%
 - C. 45%
 - D. 51%
39. The height of women taking aerobics classes at a fitness centre is normally distributed, with a mean of 170 cm and a standard deviation of 10 cm. Find the probability that a randomly selected member of these classes would have a height between 175 cm and 180 cm.
- A. 13%
 - B. 15%
 - C. 17%
 - D. 19%

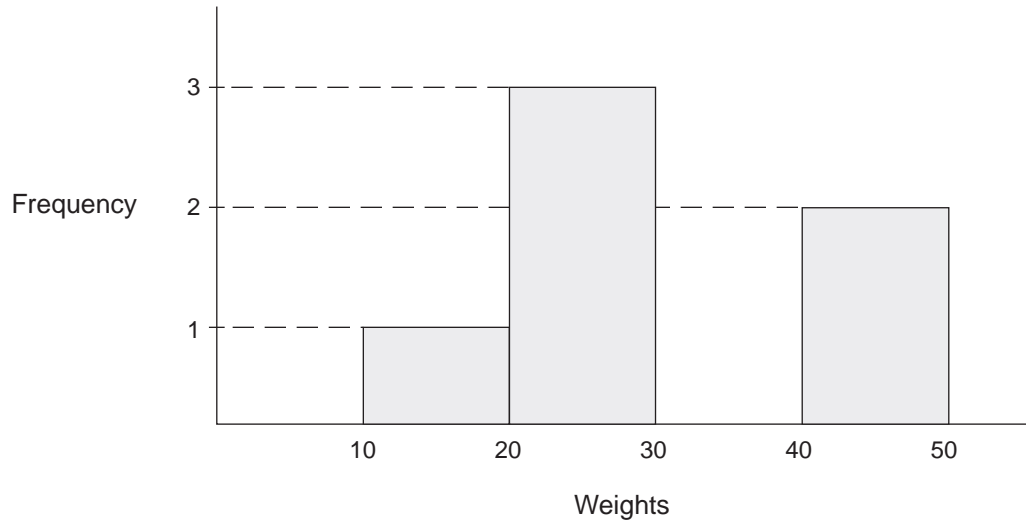
40. A fish and game club determines that the number of fish caught on different boats using the same equipment on a certain lake follows the probability distribution below.

NUMBER OF FISH CAUGHT	PROBABILITY
0	0.11
1	0.14
2	0.25
3	0.22
4	0.16
5	0.12

What is the expected value for the number of fish caught on a randomly selected boat?

- A. 1.00
 - B. 2.00
 - C. 2.54
 - D. 2.62
41. If 10% of births in this country are premature, what is the probability that, if 100 births are randomly selected, there are 6 or fewer premature births?
- A. 0.12
 - B. 0.16
 - C. 0.34
 - D. 0.38

42. Determine the standard deviation for the data presented in the histogram below.

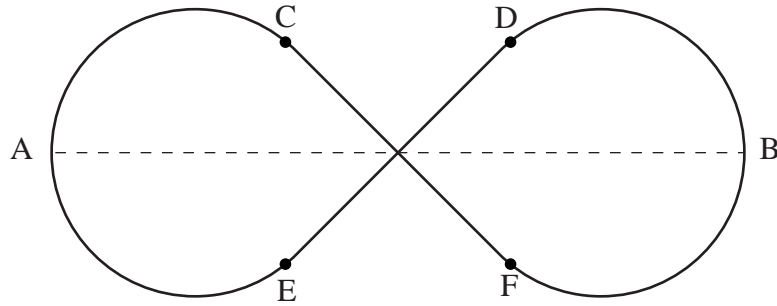


- A. 11.18
- B. 12.25
- C. 27.39
- D. 30.00

43. Ignoring the area code, how many 7-digit palindromic phone numbers can be created if the first digit is not 0 ?

- A. 9 000
- B. 10 000
- C. 9 000 000
- D. 10 000 000

44. A figure-8 race track for slot cars is made by combining the arcs of two congruent circles of radius 25 cm with straightaways CF and ED. If the angle at the intersection is 90° , determine the distance, in cm, from A to B.



- A. 100
 B. 150
 C. $50 + 50\sqrt{2}$
 D. $50 + 50\sqrt{3}$
45. To model a long-term trend problem, a student set up the following system:

$$[x \ y \ z] \begin{bmatrix} .3 & .3 & .4 \\ .2 & .2 & .6 \\ .1 & .4 & .5 \end{bmatrix} = [x \ y \ z]$$

What percent of the population will eventually be in category z ?

- A. 16.49%
 B. 31.96%
 C. 35.06%
 D. 51.55%

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

PART B: WRITTEN RESPONSE

Value: 25 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 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 window dimensions.

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.

Use the following spreadsheet to answer question 1.

A	B	C	D	E	F
Payment	Bal. Before	Payment	Payment	Interest	Outstanding
#	Payment		to Princ.	Payment	Princ. Balance
1	20000.00	406.01	239.34	166.67	19760.66
2	19760.66	406.01	241.33	164.67	19519.33
3	19519.33	406.01	243.34	162.66	19275.98
34	10952.10	406.01	314.74	91.27	10637.37
35	10637.37	406.01	317.36	88.64	10320.01
36	10320.01	406.01	320.01	86.00	10000.00

1. A new car valued at \$20 000 may be leased for three years and then bought for its residual value of \$10 000. The spreadsheet above shows the first three and the last three payments of a schedule for the leasing of the car over three years.

a) What is the total cost of buying the car through this lease-purchase plan? **(2 marks)**

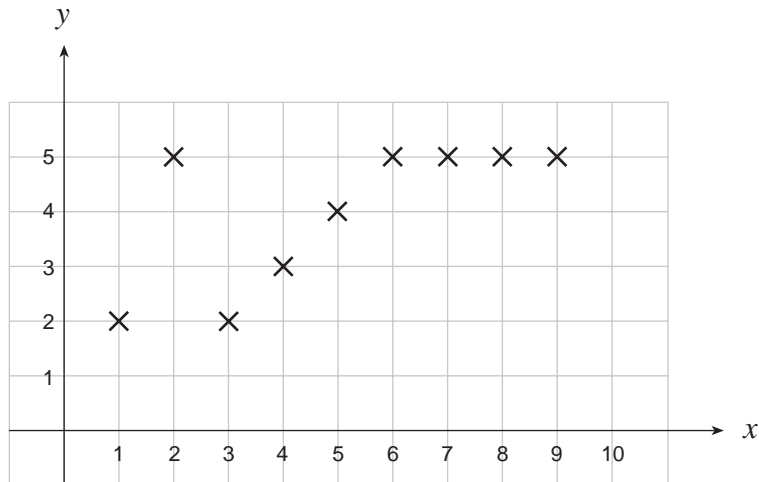
ANSWER:

- b) This car could have been purchased outright with the same interest rate and 36 monthly payments of \$645.34. How much is saved by using this option? **(1 mark)**

ANSWER:

OVER

2. A scatter plot of data points is shown below.



a) Determine the coordinates of the three summary points used to find the median-median line of best fit. **(1 mark)**

ANSWER:

b) Determine the equation of the median-median line of best fit.

(1 mark)

ANSWER:

c) Using the equation from part b), determine the value of y when the x -value is 18. **(1 mark)**

ANSWER:

OVER

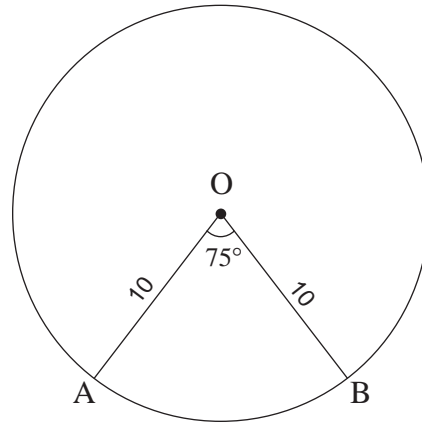
3. A factory produces light bulbs with a mean lifetime of 900 hours and a standard deviation of 100 hours. If a random sample of 36 of these light bulbs is selected, construct a 95% confidence interval for the lifetime of these bulbs. **(2 marks)**

ANSWER:

OVER

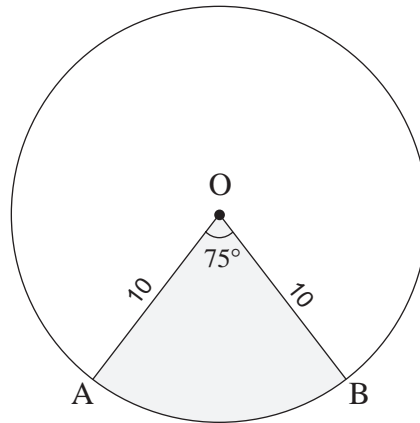
Use the following diagram to answer question 4.

Given: Circle with centre O
Radius 10 cm
 $\angle AOB = 75^\circ$



4. a) Calculate the area of the shaded sector.

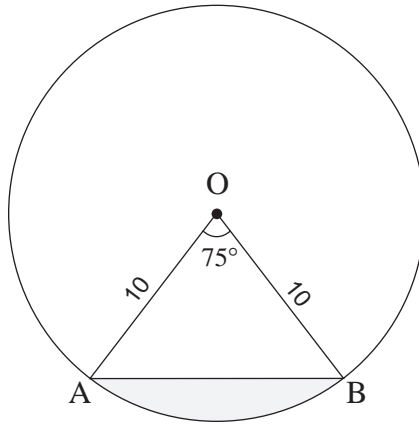
(1 mark)



ANSWER:

b) Calculate the area of the shaded segment.

(2 marks)



ANSWER:

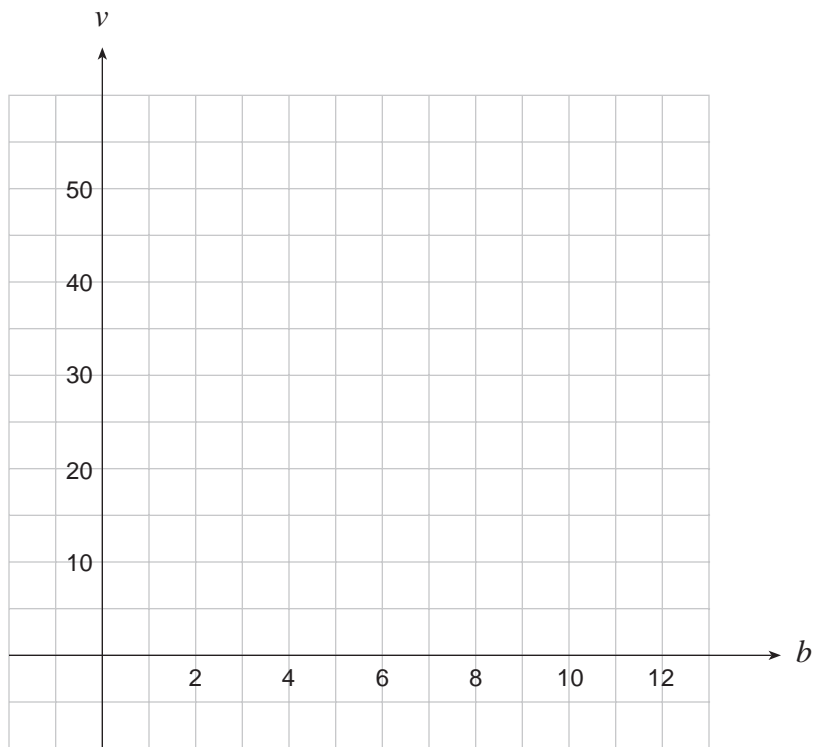
5. A car rental agency has one outlet in Vancouver, B.C. and a second outlet in Calgary, Alberta. Each month, 20% of the cars that start the month in Vancouver end up in Calgary, while 10% of the cars that start the month in Calgary end up in Vancouver. At the beginning of business, there are 500 cars in each location. How many cars will be in Vancouver after two months?
(3 marks)

ANSWER:

6. The high school ski club plans to rent buses and vans for a school trip to Blackcomb Mountain. Each bus will take 40 students, needs 3 chaperones, and costs \$1 200 to rent. Each van takes 8 students, needs 1 chaperone, and costs \$100 to rent. The planners must accommodate at least 400 students and at most 36 chaperones.
- a) If b represents the number of buses to be rented and v represents the number of vans to be rented, list the constraints and the objective function needed to determine the minimum rental cost, C . **(2 marks)**

ANSWER:

- b) Graph the feasible region and determine the minimum amount the ski club should budget for transportation costs. **(2 marks)**

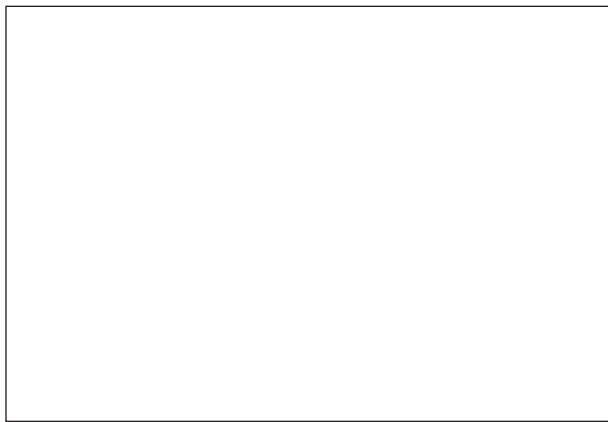


ANSWER:

OVER

7. A storage box is in the shape of a rectangular prism. It has a volume of 20 m^3 , a height of 2 m and a length that is 1 metre greater than its width. What are the dimensions of the rectangular base of the box? (Answer to the nearest 0.1 m.) **(3 marks)**

If providing a graphical solution, state the function(s) used, sketch the graph, indicate appropriate window dimensions and clearly explain how your solution is derived from the graph.



$Y_1 =$

$Y_2 =$

$Y_3 =$

$Y_4 =$

[,] [,]

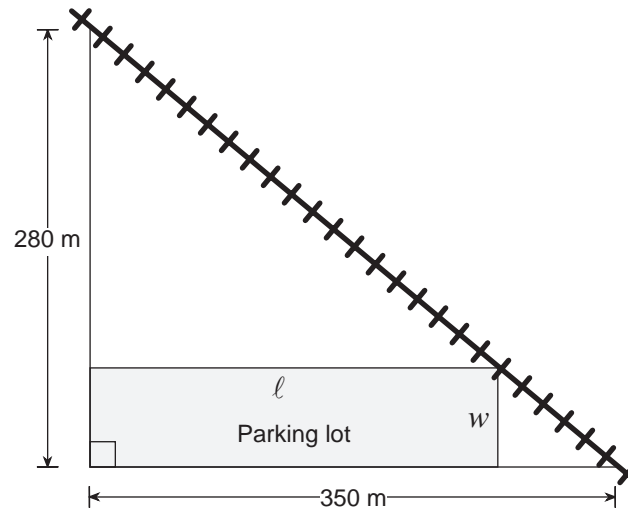
x x
min max

y y
min max

ANSWER:

OVER

8. A straight section of railroad tracks crosses two highways 350 m and 280 m from an intersection, as shown in the diagram below. A parking lot is to be constructed at the intersection.



- a) Express the width of the parking lot, w , in terms of the length, l .

(2 marks)

ANSWER:

- b) Find the dimensions of the largest rectangular parking lot that can be constructed between the highways and the railroad. **(2 marks)**

If providing a graphical solution, state the function(s) used, sketch the graph, indicate appropriate window dimensions and clearly explain how your solution is derived from the graph.



$$Y_1 =$$

$$Y_2 =$$

$$Y_3 =$$

$$Y_4 =$$

[,] [,]

x
min x
max

y
min y
max

ANSWER:

END OF EXAMINATION

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FORMULAE

Geometry:

Triangle:
$$\begin{aligned} \text{Area} &= \frac{1}{2}bh \\ &= \frac{1}{2}ab \sin C \\ &= \frac{1}{2} \frac{a^2 \sin B \sin C}{\sin A} \\ &= \sqrt{s(s-a)(s-b)(s-c)} \\ &\text{where } s = \frac{a+b+c}{2} \end{aligned}$$

Circle: $A = \pi r^2, C = 2\pi r = \pi d$

Sphere: $A = 4\pi r^2, V = \frac{4}{3}\pi r^3$

Cylinder: $A = 2\pi r^2 + 2\pi rh, V = \pi r^2 h$

Cone: $A = \pi rs + \pi r^2, V = \frac{1}{3}\pi r^2 h$

Volume of pyramid: $V = \frac{1}{3}A_b h$

Volume of prism: $V = A_b h$

Interest:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$I = Prt$$

Miscellaneous:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

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

$$S_\infty = \frac{a}{1-r}$$

Probability and Statistics:

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

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

$$\bar{x} = \frac{1}{n} \sum (f_i)(x_i)$$

$$\sigma = \sqrt{\frac{1}{n} \sum (x_i - \bar{x})^2} = \sqrt{\frac{1}{n} \sum x_i^2 - \bar{x}^2}$$

$$\mu = np$$

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

$$b(n, r; p) = \binom{n}{r} p^r q^{n-r}$$

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

$$\bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}} < \mu < \bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$E(x) = x_1 p_1 + x_2 p_2 + \dots + x_n p_n$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$r = \frac{n \sum xy - (\sum x)(\sum y)}{\left(\sqrt{n(\sum x^2) - (\sum x)^2}\right) \left(\sqrt{n(\sum y^2) - (\sum y)^2}\right)}$$

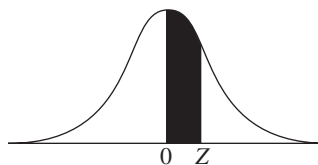
Note: Graphing calculators will contain many of these formulae as pre-programmed functions.

**You may detach this page for convenient reference.
Exercise care when tearing along perforations.**

TABLE OF Z-SCORES

Z = Z-Score

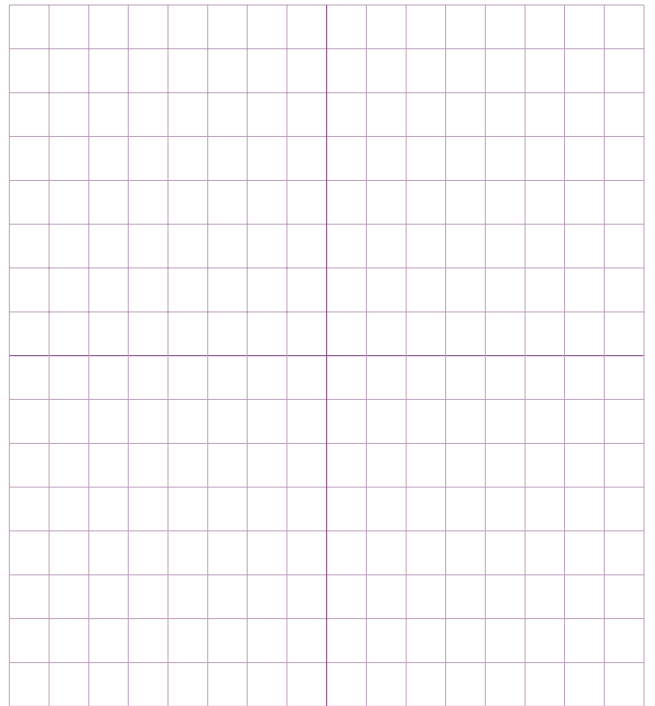
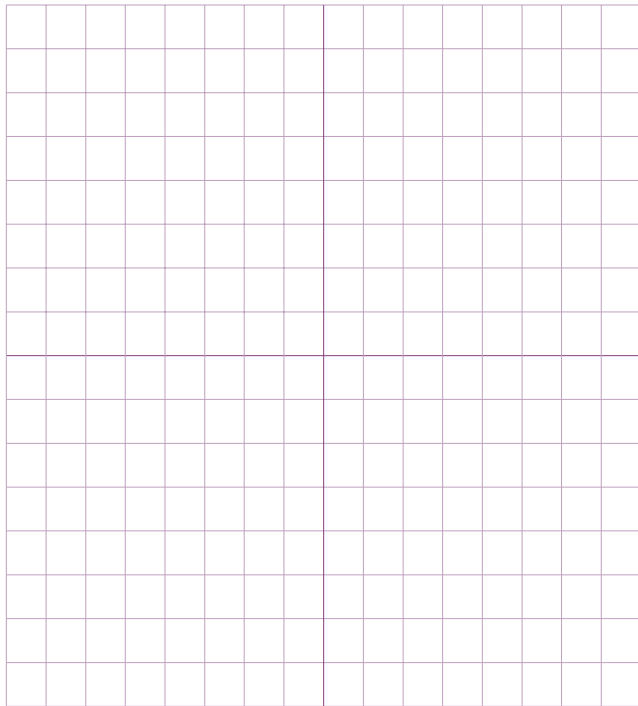
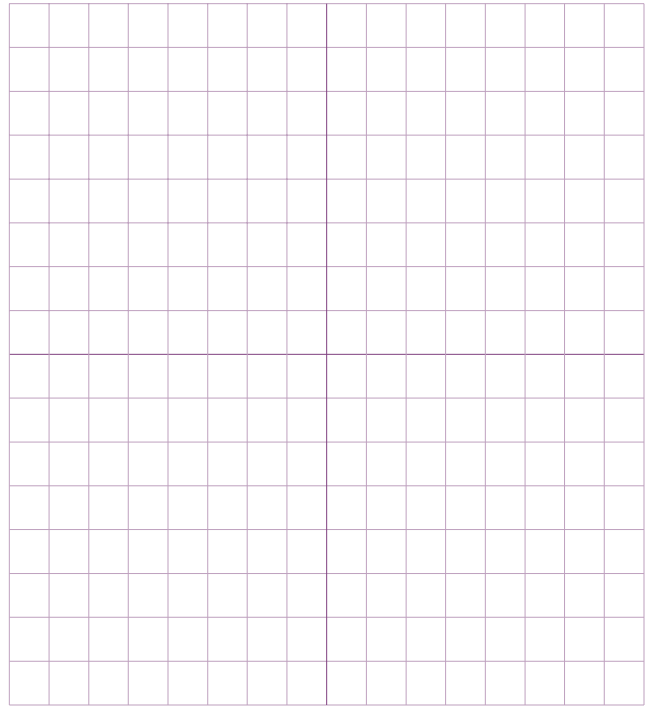
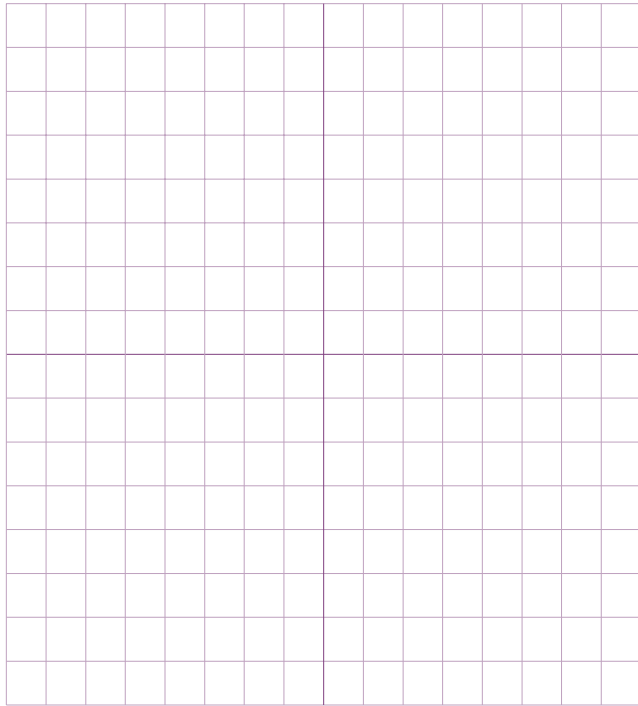
An entry in the table is the area under the curve between $Z = 0$ and a positive value of Z . Areas for negative values of Z are obtained by symmetry.



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1433	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2703	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3642	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

ROUGH WORK FOR GRAPHING

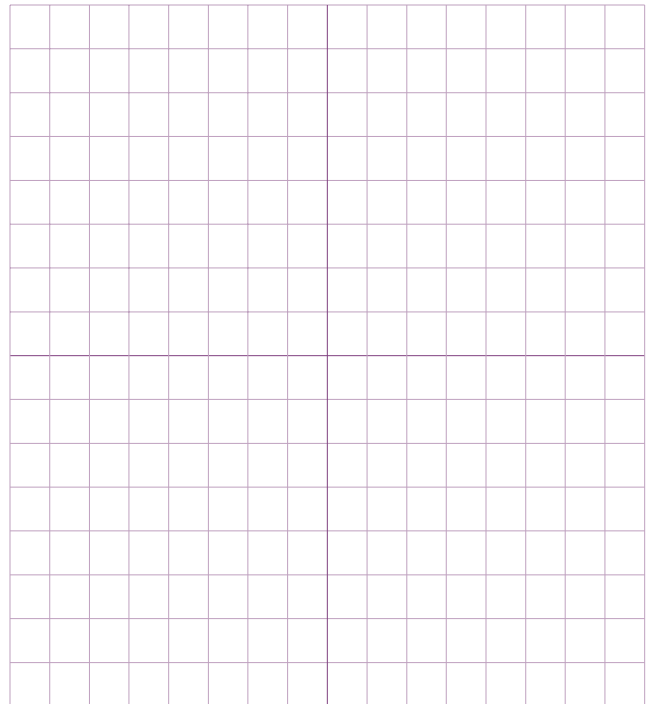
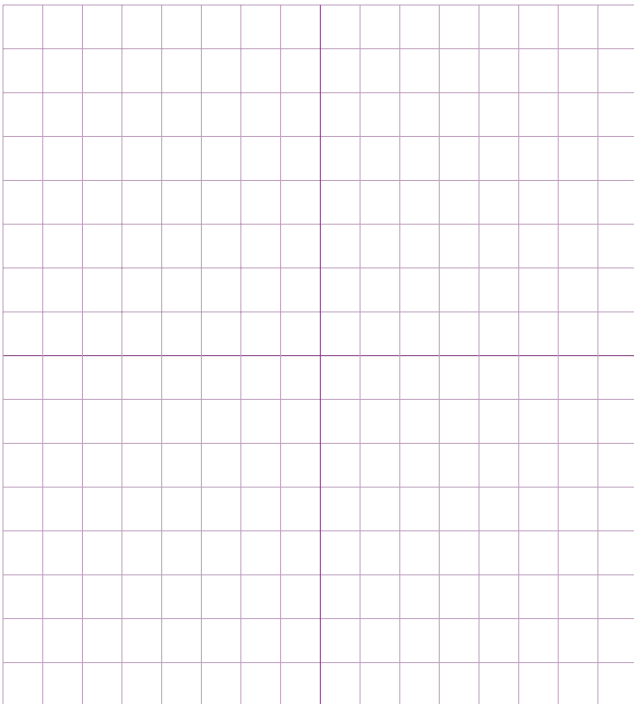
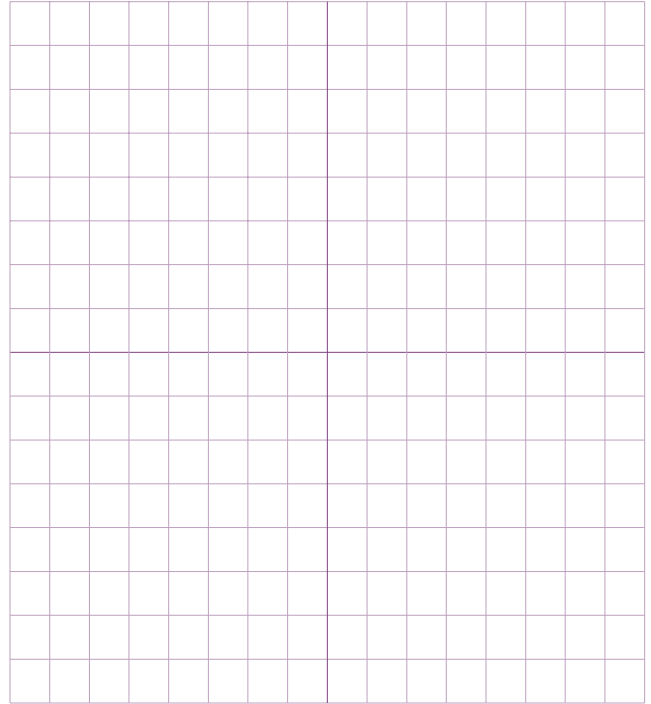
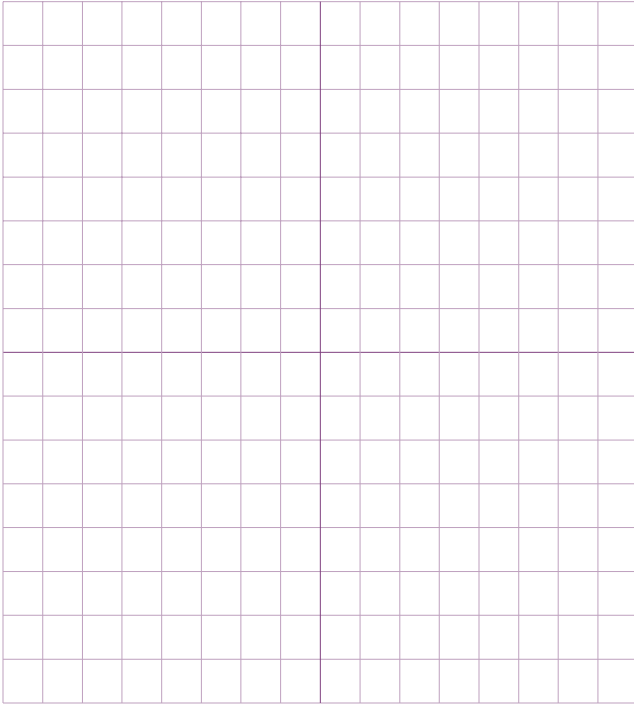
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ROUGH WORK FOR GRAPHING

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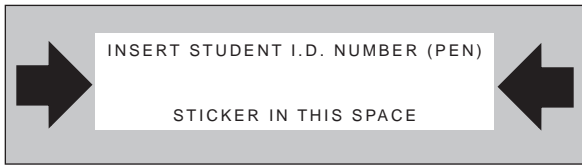


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APPLICATIONS OF MATHEMATICS 12

January 1999

Course Code = AMA

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**APPLICATIONS OF
MATHEMATICS 12**

January 1999

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Score for
Question 1a:

1. $\frac{\quad}{(2)}$

Score for
Question 4b:

8. $\frac{\quad}{(2)}$

Score for
Question 1b:

2. $\frac{\quad}{(1)}$

Score for
Question 5:

9. $\frac{\quad}{(3)}$

Score for
Question 2a:

3. $\frac{\quad}{(1)}$

Score for
Question 6a:

10. $\frac{\quad}{(2)}$

Score for
Question 2b:

4. $\frac{\quad}{(1)}$

Score for
Question 6b:

11. $\frac{\quad}{(2)}$

Score for
Question 2c:

5. $\frac{\quad}{(1)}$

Score for
Question 7:

12. $\frac{\quad}{(3)}$

Score for
Question 3:

6. $\frac{\quad}{(2)}$

Score for
Question 8a:

13. $\frac{\quad}{(2)}$

Score for
Question 4a:

7. $\frac{\quad}{(1)}$

Score for
Question 8b:

14. $\frac{\quad}{(2)}$