

Year 2002

VCE

Further Mathematics

Trial Examination 1



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VICTORIAN CERTIFICATE OF EDUCATION 2002

FURTHER MATHEMATICS

Trial Written Examination 1 (Facts, skills and applications)

Reading time: 15 minutes
Total writing time: 1 hour 30 minutes

MULTIPLE-CHOICE QUESTION BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of modules	Number of modules to be answered
A	13	13		
B	45	27	5	3

Directions to students

Materials

Question book of 34 pages.

Answer sheet for multiple-choice questions.

There is a detachable sheet of miscellaneous formula supplied.

Working space is provided throughout the book.

You may bring to the examination up to four pages (two A4 sheets) of pre-written notes.

An approved scientific and/or graphics calculator may be used.

You should have at least one pencil and an eraser.

The task

Detach the formula sheet from the book during reading time.

Please ensure that your **name and student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.

Answer **all** questions from Section A

You should select three modules from Section B and answer **all** questions within the modules selected.

Indicate the modules selected on the answer sheet for multiple-choice questions by shading the corresponding boxes.

There is a total of 13 marks available for Section A and 9 marks for each module in Section B

There is a total of 40 marks available for this examination.

All questions should be answered on the answer sheet for multiple-choice questions provided.

Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

At the end of the task

You may retain this question book.

VCE FURTHER MATHEMATICS 2002

Trial Written Examination 1

ANSWER SHEET

NAME: _____

STUDENT
NUMBER _____

SIGNATURE _____

Instructions

- Write your name in the space provided above.
- Write your student number in the space provided above. Sign your name.
- Use a **PENCIL** for **ALL** entries.
If you make a mistake, **ERASE** it - **DO NOT** cross it out.
- Marks will **NOT** be deducted for incorrect answers.
- **NO MARK** will be given if more than **ONE** answer is completed for any question.
- All answers must be completed like **THIS** example.

A	B	C	D	E
---	---	---	---	---

Section A

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E

Please turn over . . .

Section B (Shade the boxes of the three modules selected)

	Module 1 Number patterns and applications	1	A	B	C	D	E
		2	A	B	C	D	E
		3	A	B	C	D	E
		4	A	B	C	D	E
		5	A	B	C	D	E
		6	A	B	C	D	E
		7	A	B	C	D	E
		8	A	B	C	D	E
		9	A	B	C	D	E
	Module 2 Geometry and trigonometry	1	A	B	C	D	E
		2	A	B	C	D	E
		3	A	B	C	D	E
		4	A	B	C	D	E
		5	A	B	C	D	E
		6	A	B	C	D	E
		7	A	B	C	D	E
		8	A	B	C	D	E
		9	A	B	C	D	E
	Module 3 Graphs and relations	1	A	B	C	D	E
		2	A	B	C	D	E
		3	A	B	C	D	E
		4	A	B	C	D	E
		5	A	B	C	D	E
		6	A	B	C	D	E
		7	A	B	C	D	E
		8	A	B	C	D	E
		9	A	B	C	D	E
	Module 4 Business-related mathematics	1	A	B	C	D	E
		2	A	B	C	D	E
		3	A	B	C	D	E
		4	A	B	C	D	E
		5	A	B	C	D	E
		6	A	B	C	D	E
		7	A	B	C	D	E
		8	A	B	C	D	E
		9	A	B	C	D	E
	Module 5 Networks and decision mathematics	1	A	B	C	D	E
		2	A	B	C	D	E
		3	A	B	C	D	E
		4	A	B	C	D	E
		5	A	B	C	D	E
		6	A	B	C	D	E
		7	A	B	C	D	E
		8	A	B	C	D	E
		9	A	B	C	D	E

Please DO NOT fold, bend or staple this form

FURTHER MATHEMATICS

Written examinations 1 and 2

FORMULA SHEET

Directions to students

Detach this formula sheet during reading time.

This formula sheet is provided for your reference.

Further Mathematics Formulas

Business-related mathematics

simple interest:
$$I = \frac{\text{Pr } T}{100}$$

compound interest:
$$A = PR^n \text{ where } R = 1 + \frac{r}{100}$$

hire purchase:
$$\text{effective rate of interest} = \frac{2n}{n+1} \times \text{flat rate}$$

annuities:
$$A = PR^n - \frac{Q(R^n - 1)}{R - 1}, \text{ where } R = 1 + \frac{r}{100}$$

Geometry and trigonometry

area of a triangle:
$$\frac{1}{2}bh$$

area of a triangle:
$$\frac{1}{2}bc \sin A$$

area of circle:
$$\pi r^2$$

volume of sphere:
$$\frac{4}{3}\pi r^3$$

volume of cone:
$$\frac{1}{3}\pi r^2 h$$

Pythagoras' theorem:
$$c^2 = a^2 + b^2$$

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

cosine rule:
$$c^2 = a^2 + b^2 - 2ab \cos C$$

Graphs and relations

Straight line graphs

gradient
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

equation
$$y - y_1 = m(x - x_1)$$
 gradient-point form

$$y = mx + c$$
 gradient-intercept form

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$
 two-point form

Number patterns and applications

arithmetic series: $a + (a + d) + \dots + (a + (n - 1)d) = \frac{n}{2}[2a + (n - 1)d] = \frac{n}{2}(a + l)$

geometric series: $a + ar + ar^2 + \dots + ar^{n-1} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$

infinite geometric series: $a + ar + ar^2 + ar^3 + \dots = \frac{a}{1 - r}, |r| < 1$

linear difference equations: $t_n = at_{n-1} + b = a^{n-1}t_1 + b\frac{(a^{n-1} - 1)}{a - 1}, a \neq 1$
 $= a^n t_0 + b\frac{(a^n - 1)}{a - 1}$

Networks and decision mathematics

Euler's formula: $v + f = e + 2$

Statistics

seasonal index: $\text{seasonal index} = \frac{\text{actual figure}}{\text{deseasonalised figure}}$

END OF FORMULA SHEET

Specific Instructions for Section A

Section A consists of 13 questions

Answer **all** questions in this section.

A correct answer scores 1 mark, an incorrect answer scores 0. No mark will be given for a question if two or more letters are shaded for that question. Marks will not be deducted for incorrect answers and you should attempt every question.

Core

The following stem and leaf relates to Questions 1 and 2.

$$10 \mid 1 = 101$$

10	1 3 5
11	2 4 5 9 9
12	3 3 4 5 9
13	1 2 2 3 6 6
14	4 4 8 9
15	1 6 6 8

Question 1

The median of the data in the above stem and leaf is

- A. 1
- B. 19
- C. 129
- D. 131
- E. 132

Question 2

The interquartile range of the data in the stem and leaf is:

- A. 12
- B. 15
- C. 25
- D. 27
- E. 119

Question 3

The height of 15 students in a year 12 mathematics class is recorded . This data is an example of

- A.** discrete data
- B.** continuous data
- C.** categorical data
- D.** random sample data
- E.** bell shaped distribution data

Question 4

The component of a time series that could best be used to describe the effect of Christmas sales upon a retail department store is

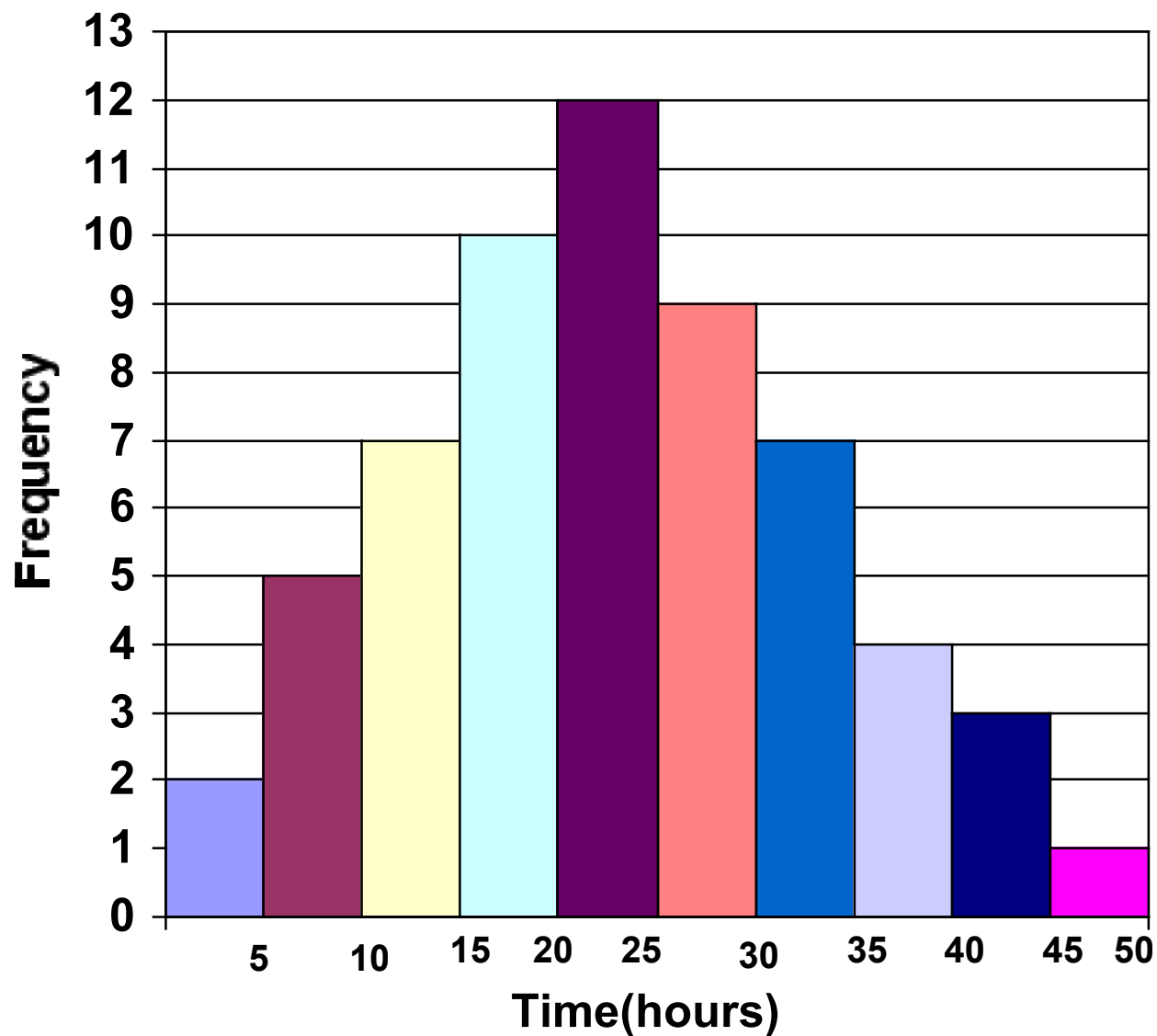
- A.** secular trend
- B.** cyclical fluctuations
- C.** seasonal variation
- D.** random variation
- E.** linear trend line

The following information relates to questions 5 and 6

Students were asked how much time they spent watching television each week.

The results are displayed in the graph below.

Time Spent Watching T.V.



Question 5

The number of students interviewed was

- A. 10
- B. 12
- C. 25
- D. 50
- E. 60

Question 6

The percentage of these students who watch more than 25 hours of television a week is closest to

- A. 35%
- B. 40%
- C. 45%
- D. 50%
- E. 55%

Question 7

To show the association between the number of hours spent on mathematics homework each week and the percentage obtained in a mathematics test, the most appropriate graph would be a

- A. scatter plot
- B. stem plot
- C. box plot
- D. bar chart
- E. bell shaped curve

Question 8

Data was obtained for the maximum daily temperature and the daily rainfall in Melbourne over the month of February and Pearson's correlation coefficient was found to be 0.92. This information suggests that

- A. higher daily temperatures cause higher daily rainfall.
- B. as the temperature increases the rainfall decreases.
- C. about 92% of the variation in the daily rainfall can be explained by the variation in the maximum daily temperature.
- D. about 85% of the variation in the daily rainfall can be explained by the variation in the maximum daily temperature.
- E. about 10% of the variation in the daily rainfall can be explained by the variation in the maximum daily temperature.

The following information relates to questions 9 and 10

The unemployment rate and the rate of inflation from eight different countries are listed in the table below

Unemployment Rate (%)	Rate of Inflation (%)
5.6	17.4
10.8	8.6
13.1	4.9
6.5	12.2
10.4	6.9
7.3	9.5
8.6	8.7
6.7	10.8

When plotted on a scatter graph, it was noted that there was a strong linear relation between the two variables.

Question 9

The least squared equation that would enable the unemployment rate to be predicted from the rate of inflation for this data is:

- A. unemployment rate = $20.7 - 1.3 \times$ rate of inflation.
- B. unemployment rate = $14.5 - 0.6 \times$ rate of inflation.
- C. unemployment rate = $14.5 + 0.6 \times$ rate of inflation.
- D. unemployment rate = $0.6 - 14.5 \times$ rate of inflation.
- E. unemployment rate = $20.7 \times$ rate of inflation $- 1.3$

Question 10

If the unemployment rate was 9.5%, then we could expect the inflation rate to be closest to

- A. 6.3%
- B. 6.4%
- C. 8.3%
- D. 8.4%
- E. 8.6%

Question 11

If the line of best fit for a set of data has the equation $y = 0.64x + 31.2$ then the residual of an original point with the coordinates (82.4,89.8) is closest to

- A. 1.5
- B. 5.9
- C. 7.4
- D. 8.6
- E. 9.2

Question 12

Year	1	2	3	4	5	6	7	8	9
Sales('000)	72	79	85	89	87	90	92	93	95

Using the three-median method, the gradient of the trend line for the above set of data, showing sales for the year in thousands of dollars is closest to

- A. 0.06
- B. 0.43
- C. 0.77
- D. 2.33
- E. 2.71

Question 13

The number of cars produced by a company each quarter was recorded over a two year period. The results are listed in the table below.

Year	Quarter	Number of cars produced	4 point centred moving average
2000	1	2075	
	2	1936	
	3	2843	
	4	1564	
2001	1	3485	
	2	3792	X
	3	3520	
	4	2612	

Using a centred 4 – point moving average on the data in the above table, the value of **X** is closest to

- A.** 2921
- B.** 3006
- C.** 3090
- D.** 3221
- E.** 3352

END OF SECTION A

Specific Instructions for Section B

Section A consists of 5 modules

You should select 3 modules and answer **all** questions within the modules on the answer sheet for multiple-choice questions provided. Indicate the modules selected on the answer sheet for multiple-choice questions by shading the corresponding boxes.

A correct answer scores 1 mark, an incorrect answer scores 0. No mark will be given for a question if two or more letters are shaded for that question. Marks will not be deducted for incorrect answers and you should attempt every question within the modules selected.

Module	Page
Module 1: Number patterns and applications	9
Module 2: Geometry and trigonometry	13
Module 3: Graphs and relations	18
Module 4: Business-related mathematics	24
Module 5: Networks and decision mathematics	29

Module 1: Number patterns and applications

Before answering these questions you **must** shade the **Number patterns and applications** box on the answer sheet for multiple-choice questions

Question 1

For the sequence 6, 3, 0, -3 which one of the following statements is true?

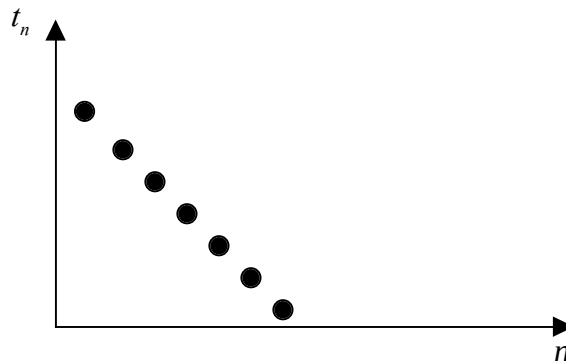
- A. $t_n = 6 - 4n$
- B. $t_n = 9 + 3n$
- C. This is a geometric sequence with a common ratio of $\frac{1}{2}$.
- D. This is an arithmetic sequence with a common difference of 3.
- E. The sum of the first five terms of this sequence is zero.

Question 2

For the sequence 18, 170, 322, 474..... the value of the sixteenth term is

- A. 2268
- B. 2298
- C. 2418
- D. 2450
- E. 5016

Question 3



The above graph represents the discrete terms of a sequence.

Which one of the following statements best represents this sequence?

- A. This is an arithmetic sequence with the common difference, d , greater than 0
- B. This is an arithmetic sequence with the common difference, d , less than 0
- C. This is a geometric sequence with the common ratio, r , greater than 0
- D. This is a geometric sequence with the common ratio, r , less than 0
- E. This is a geometric sequence with $0 < r < 1$ where r is the common ratio.

Question 4

The sum to infinity of the geometric sequence 18, 12, 8 is

- A. 36
- B. 54
- C. 62
- D. 102
- E. 108

Question 5

If $t_{n+1} = 4t_n - 1$ and $t_1 = 1$ then which one of the following is the sequence generated by this difference equation?

- A. 1, 3, 11, 43
- B. 1, 4, 16, 64
- C. 1, 3, 9, 27
- D. 1, 3, 13, 53
- E. 1, 3, 4, 15

Question 6

Kim, Kylie and Ken are to receive an inheritance which is divided in the ratio of 3 : 4 : 5. If Kim receives \$120,000 then the total value of the inheritance is

- A. \$200,000
- B. \$360,000
- C. \$480,000
- D. \$1,000,000
- E. \$1,440,000

Question 7

The sum of all integers between 200 and 500 which are exactly divisible by 7 is

- A. 12,210
- B. 14,700
- C. 15,050
- D. 17,400
- E. 105,000

Question 8

A car was purchased new for \$36,000 on 1st January, 2002 and its rate of depreciation is 15% per year. The year in which its value will fall below \$18,000, if the value of the depreciated vehicle is adjusted on 1st January each year, is

- A. 2004
- B. 2005
- C. 2006
- D. 2007
- E. 2008

Question 9

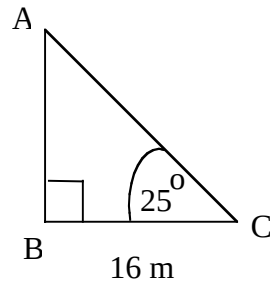
If two gears, A and B, have 8 cogs and 20 cogs respectively, then the gear ratio of gear A compared to gear B is

- A. 2 : 7
- B. 5 : 2
- C. 7 : 2
- D. 7 : 5
- E. 8 : 20

End of Module 1

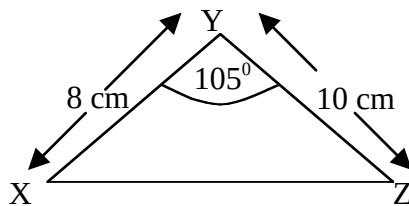
Module 2: Geometry and trigonometry

Before answering these questions you **must** shade the **Geometry and trigonometry** box on the answer sheet for multiple-choice questions

Question 1

Using the information given in the above diagram, the length of AB is closest to

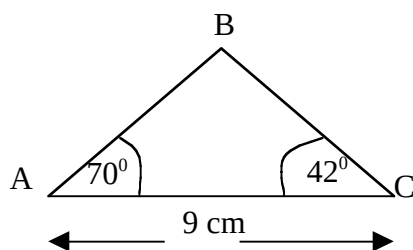
- A. 6.76 m
- B. 7.46 m
- C. 14.51 m
- D. 19.21 m
- E. 34.31 m

Question 2

The area of triangle XYZ in cm^2 is closest to

- A. 10.35
- B. 19.32
- C. 20.71
- D. 38.64
- E. 77.27

Question 3



In triangle ABC, $AC = 9$ cm, angle $BAC = 70^\circ$ and angle $BCA = 42^\circ$. The length of BC in cm is closest to

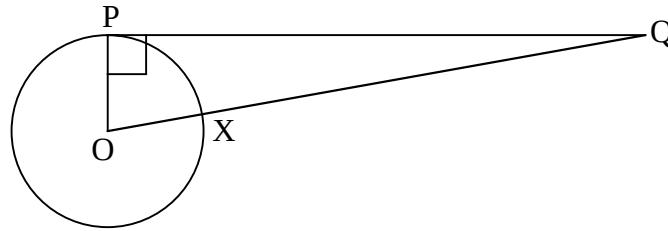
- A. 6.41
- B. 8.88
- C. 9.12
- D. 10.33
- E. 12.64

Question 4

A pipe of length H m and radius R m can hold V m³ of water where $V = \pi R^2 H$. If the height is halved and the radius is doubled, then the amount of water the pipe can now hold is

- A. the same amount as before
- B. half of what it held before
- C. double what it held before
- D. four times what it held before
- E. eight times what it held before

Question 5



If the line OQ cuts the circle with radius equal to 5 cm at X and if $QX = 13$ cm, then the length of PQ is closest to

- A. 12 cm
- B. 14 cm
- C. 17 cm
- D. 18 cm
- E. 19 cm

Question 6

Ethan conducts a traverse survey of a field. His note book entries where the measurements are in metres are shown below

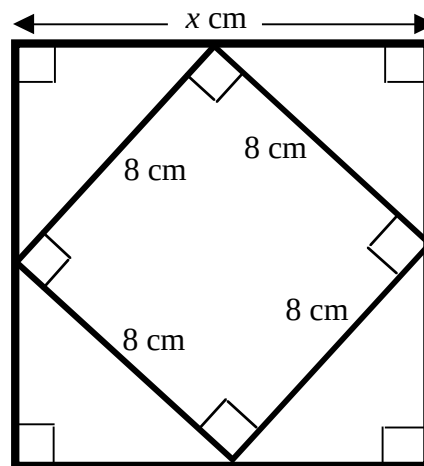
	B	
	52	
	44	
D 17	32	
	20	C 12
	0	
	A	

The length of AD is closest to

- A. 21 m
- B. 26 m
- C. 36 m
- D. 49 m
- E. 55 m

Question 7

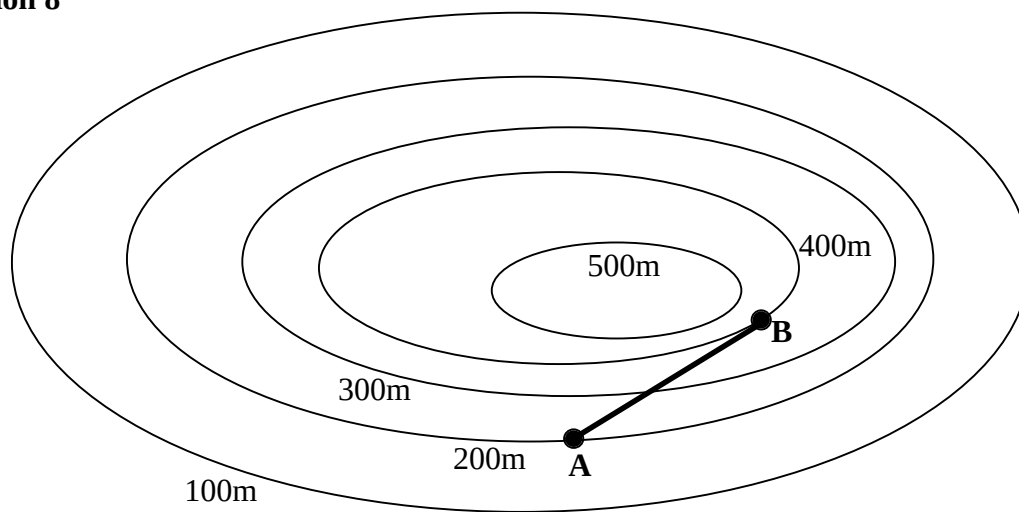
A square of length 8 cm is placed inside a square of length x cm as shown in the diagram below.



The value of x is closest to

- A. 8 cm
- B. 11.3 cm
- C. 16 cm
- D. 17.1 cm
- E. 22.6 cm

Question 8



If the direct distance from **A** to **B** in the contour map shown above is 447 m, then the gradient of the line joining **A** and **B** is closest to

- A. 0.3
- B. 0.5
- C. 2
- D. 3
- E. 26.6

Question 9

A boat travels in a direction $N 56^\circ W$ until it is 36 km north of its starting point. The distance west of its starting point is now closest to

- A. 20.13 km
- B. 24.28 km
- C. 29.85 km
- D. 43.42 km
- E. 53.37 km

End of Module 2

Module 3: Graphs and relations

Before answering these questions you **must** shade the **Graphs and relations** box on the answer sheet for multiple-choice questions

Question 1

The equation of the line joining the points $(-2, 5)$ and $(6, 9)$ is

- A. $y - x - 3 = 0$
- B. $y - x - 7 = 0$
- C. $y + x - 15 = 0$
- D. $y - 2x + 3 = 0$
- E. $2y - x - 12 = 0$

Question 2

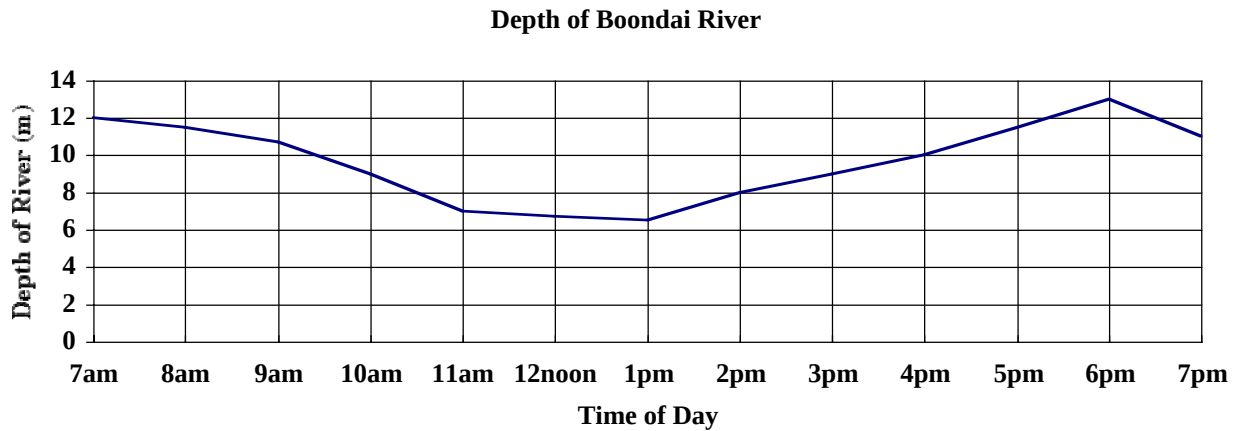
x	0	2	4	6
y	0	6	24	54

If $y = kx^2$ and x and y have the values set out in the table above, then k equals

- A. 1.5
- B. 2
- C. 2.5
- D. 3
- E. 3.5

The following information relates to questions 3, 4 and 5

The depth of water in the Boondai River depends upon the tides. The graph below shows the water level from 7.00 am to 7.00 pm on a certain day.



Question 3

The time in hours between the lowest depth of water and the next highest tide is

- A. 5
- B. 6
- C. 7
- D. 9
- E. 11

Question 4

If there is a bridge 15 m above the bottom of the river bed, the number of hours between 7.00 am and 7.00 pm on this particular day that a ship requiring 6 m clearance can sail under the bridge is

- A.** 2
- B.** 3
- C.** 5
- D.** 6
- F.** 9

Question 5

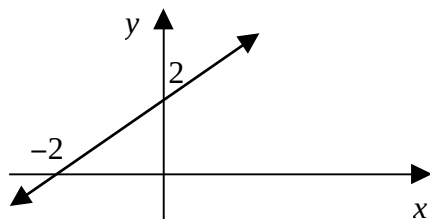
The period of time when the water level is falling most rapidly is

- A.** 7.00 am – 8.00 am
- B.** 8.00 am – 9.00 am
- C.** 9.00 am – 10.00 am
- D.** 11.00 am – 12.00 noon
- E.** 4.00 pm – 5.00 pm

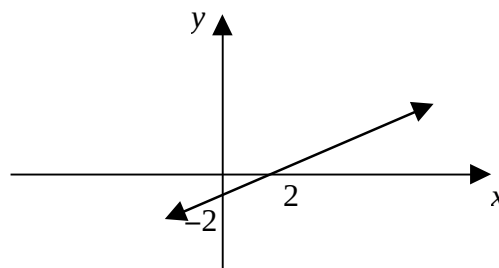
Question 6

Which one of the following graphs could represent the relation $y = 2x^{-2}$?

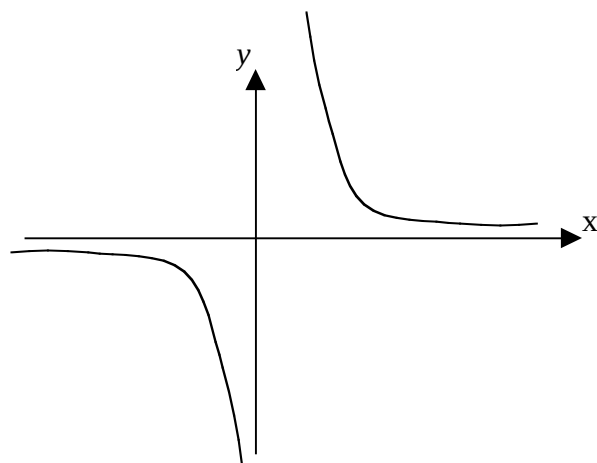
A.



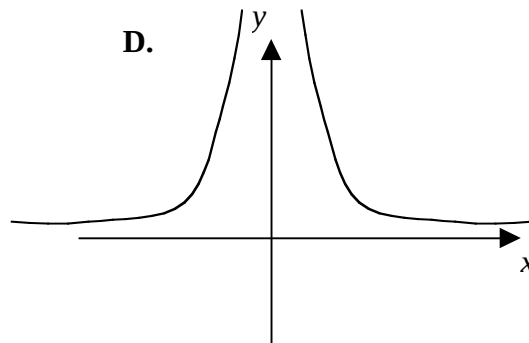
B.



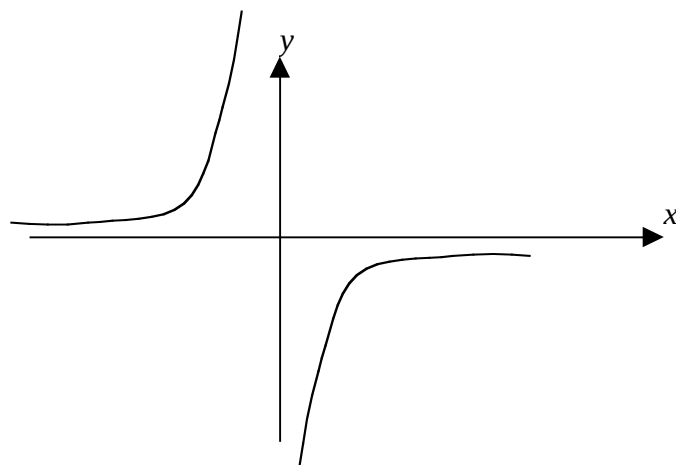
C.



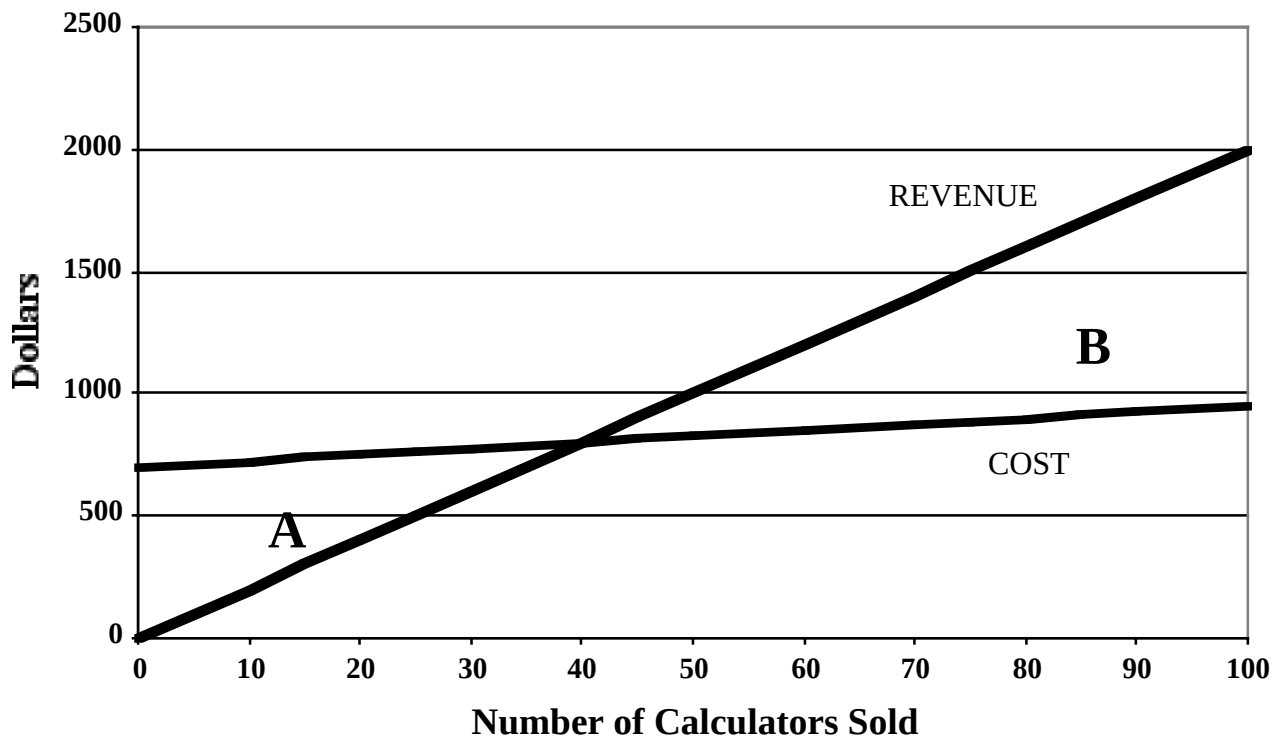
D.



E.



The following information relates to questions 7 and 8



The graph above shows the cost and revenue functions versus the number of calculators sold by the Mache Stationers

Question 7

The number of calculators that must be sold to break even is

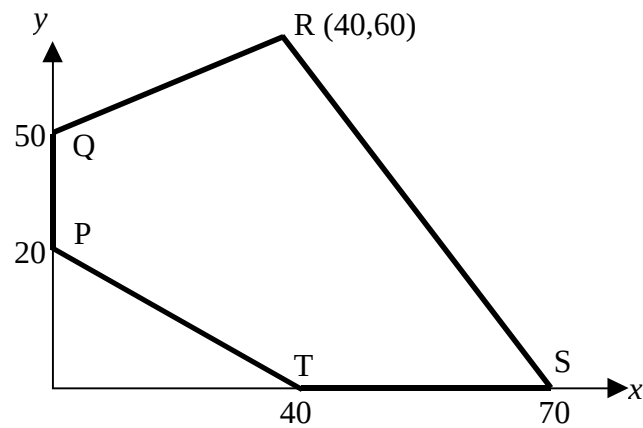
- A. 0
- B. 20
- C. 30
- D. 40
- E. 900

Question 8

Which one of the following statements is true for the given graph?

- A. The revenue is always greater than the cost
- B. Region A represents a profit
- C. The fixed cost is the gradient of the cost line
- D. The fixed cost is \$200
- E. When 45 calculators are sold the Mache Stationer makes a profit

Question 9



Considering all the points on and within the boundary PQRST, if $Z = 3x - y$ then the maximum value of Z occurs at

- A. P
- B. Q
- C. R
- D. S
- E. T

End of Module 3

Module 4: Business-related mathematics

Before answering these questions you **must** shade the **Business-related mathematics** box on the answer sheet for multiple-choice questions

Question 1

Milak buys \$50,000 worth of debentures in the U Burn Gas Company. The debentures pay 10% simple interest per annum paid half yearly for a period of three years. The total value of Milak's investment at the end of the 3 years will be

- A. \$15,000
- B. \$32,500
- C. \$57,500
- D. \$65,000
- E. \$80,000

The following information relates to questions 2 and 3

Ming borrows \$20,000 for 8 years from the I.O.U. Banking Corporation.
The repayments are \$480 per month.

Question 2

The amount of interest Ming will pay is

- A. \$23,840
- B. \$25,760
- C. \$26,080
- D. \$46,080
- E. \$66,080

Question 3

The equivalent flat interest rate per annum for the loan is closest to

- A.** 8.4%
- B.** 12.3%
- C.** 14.9%
- D.** 15.5%
- E.** 16.3%

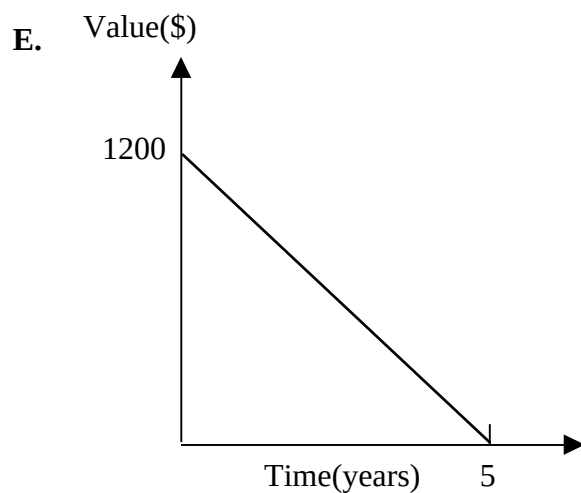
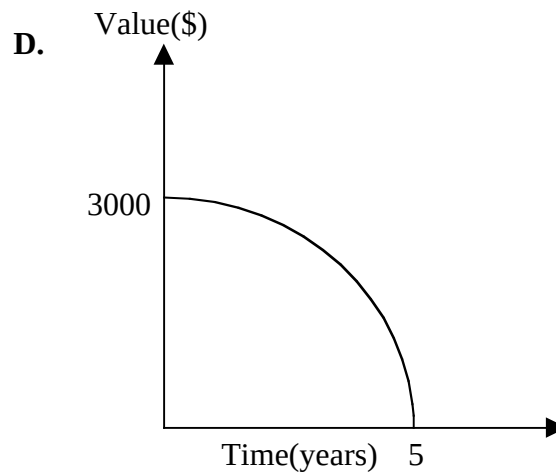
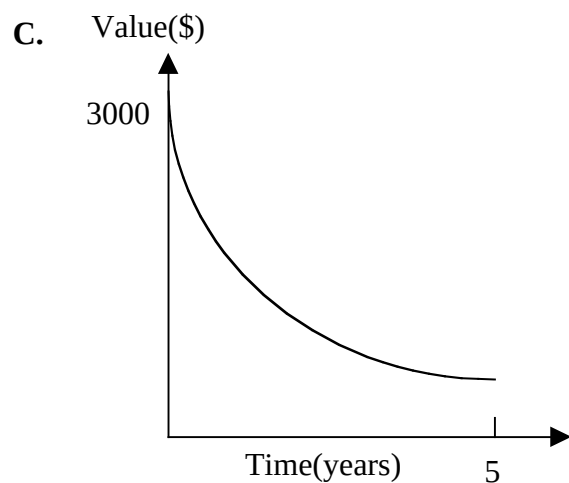
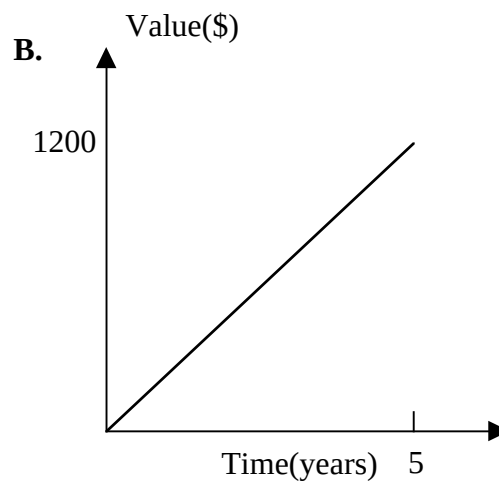
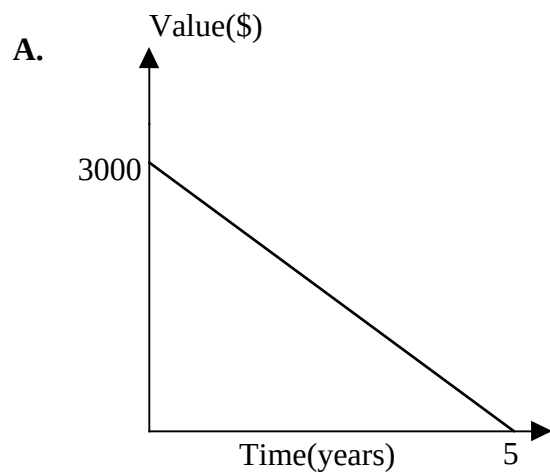
Question 4

Marita borrows \$6,000 for 5 years so that she can furnish her new home. She repays the money in equal quarterly repayments at 8% per annum flat rate. The effective rate of interest per annum is closest to

- A.** 15.2%
- B.** 15.7%
- C.** 16.1%
- D.** 16.4%
- E.** 16.9%

Question 5

A computer worth \$3,000 depreciates in value by a compounding factor of 0.4 every year.
The graph which best displays this information is



Question 6

Jillian invests \$5,000. If the interest is 12% per annum compounded quarterly, then the amount of interest she has earned after 2 years is closest to

- A. \$304
- B. \$1,280
- C. \$1,334
- D. \$6,334
- E. \$7,380

Question 7

The following is an extract from a bank account showing all transactions from 1st December to the 28th February.

Date	Debits	Credits	Balance
1 Dec			\$9,960
24 Dec		\$4,780	\$14,740
4 Jan	\$1,825		\$12,915
29 Jan	\$684		\$12,231
15 Feb		\$1,095	\$13,326

Interest is paid on 1st March for the 1st December to the 28th February quarter. The interest is calculated on the minimum monthly balance at a rate of 4% per annum. The amount of interest paid on 1st March was closest to

- A. \$33.20
- B. \$99.60
- C. \$114.75
- D. \$118.40
- E. \$1,376.90

Question 8

Rick has a \$12,000 loan which he took out on 1st January, 2002. He pays an interest rate of 6% per annum on the reducing yearly balance and he repays \$3,000 per year on 1st January. The year in which he will completely repay his loan is

- A. 2004
- B. 2005
- C. 2006
- D. 2007
- E. 2008

Question 9

Nadia borrows money from the bank to buy a house. The price of the house is \$230,000 and she has saved \$80,000 as a deposit. The bank gives her a loan for the balance which she repays over 20 years in equal monthly instalments. If interest is 6% per annum on the reducing monthly balance, then the monthly instalment is closest to

- A. \$1,075
- B. \$1,508
- C. \$1,625
- D. \$1,648
- C. \$2,380

End of Module 4

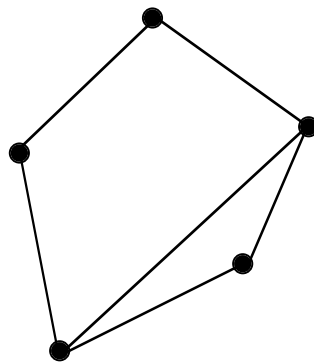
Module 5: Networks and decision mathematics

Before answering these questions you **must** shade the **Networks and decision mathematics** box on the answer sheet for multiple-choice questions

Question 1

A connected planar graph consists of:

- A. edges which cross
- B. vertices, faces and edges where $v + e - f = 2$
- C. vertices, faces and edges where $v + f - e = 2$
- D. vertices, faces and edges where $e + f - v = 2$
- E. a relationship between two distinct groups

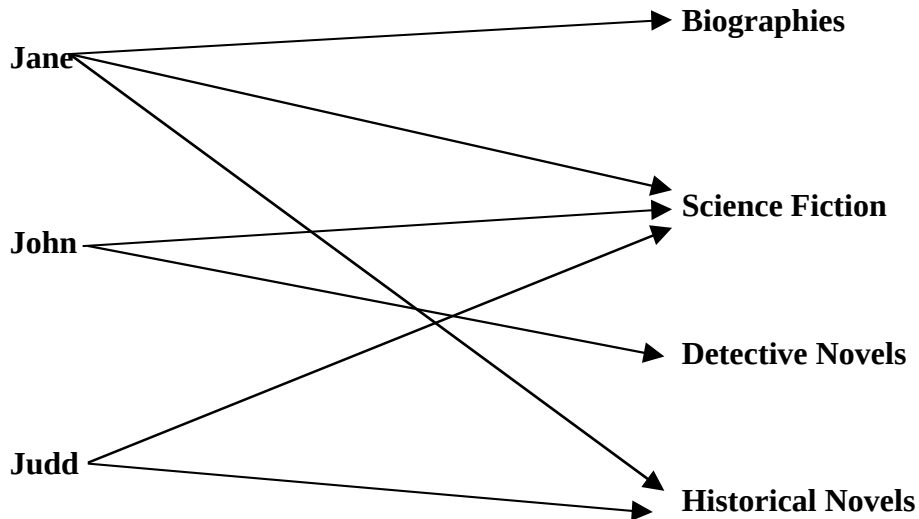
Question 2

Which one of the following statements is true for the above network?

- A. An Euler path exists but not an Euler circuit.
- B. An Euler circuit exists but not an Euler path.
- C. Both an Euler circuit and an Euler path exist.
- D. An Euler path exists but not a Hamiltonian path.
- E. Both an Euler circuit and a Hamiltonian circuit exist.

Question 3

The following bipartite graph shows the type of books that Jane, John and Judd like to read.



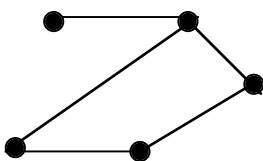
Which one of the following statements is **NOT** true?

- A. Judd likes reading science fiction and historical novels.
- B. Jane does not like reading detective novels.
- C. All three people like reading science fiction.
- D. Jane reads the greatest variety of the types of books listed in the graph.
- E. Detective novels are read by two of the three people.

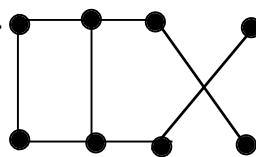
Question 4

Which one of the following graphs has a Hamiltonian circuit?

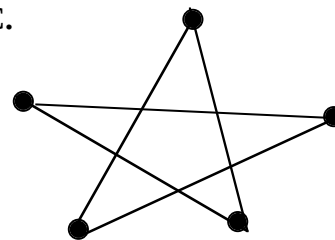
A.



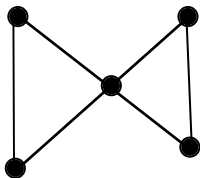
B.



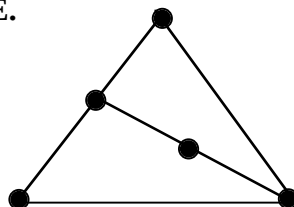
C.



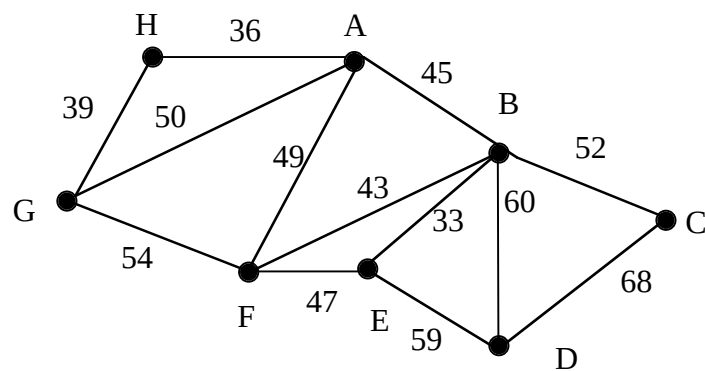
D.



E.



Question 5



The total length of the minimal spanning tree in the graph above is

- A. 282
- B. 295
- C. 303
- D. 307
- E. 308

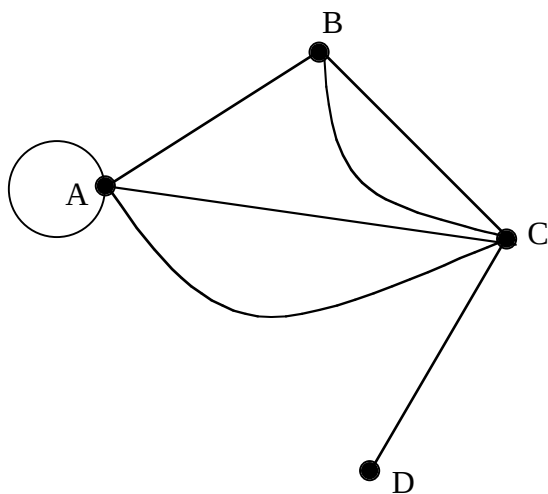
Question 6

Raymond, Ruth and Ron are to complete three jobs in the garden, pruning, planting, and weeding. If the reduced matrix for these activities is

	Prune	Plant	Weed
Raymond	3	0	0
Ruth	0	0	2
Ron	2	3	0

then the best way to assign the activities so as to take the shortest time is:

- A. Raymond prune, Ruth plant and Ron weed.
- B. Raymond prune, Ron plant and Ruth weed.
- C. Raymond weed, Ruth plant and Ron prune.
- D. Raymond plant, Ruth weed and Ron prune.
- E. Raymond plant, Ruth prune and Ron weed.



The adjacency matrix for the graph above is:

A.

$$\begin{vmatrix} 2 & 1 & 2 & 0 \\ 1 & 0 & 2 & 0 \\ 2 & 2 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{vmatrix}$$

B.

$$\begin{vmatrix} 5 & 3 & 2 & 0 \\ 1 & 0 & 2 & 0 \\ 2 & 2 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{vmatrix}$$

C.

$$\begin{vmatrix} 1 & 1 & 2 & 0 \\ 1 & 0 & 2 & 0 \\ 2 & 2 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{vmatrix}$$

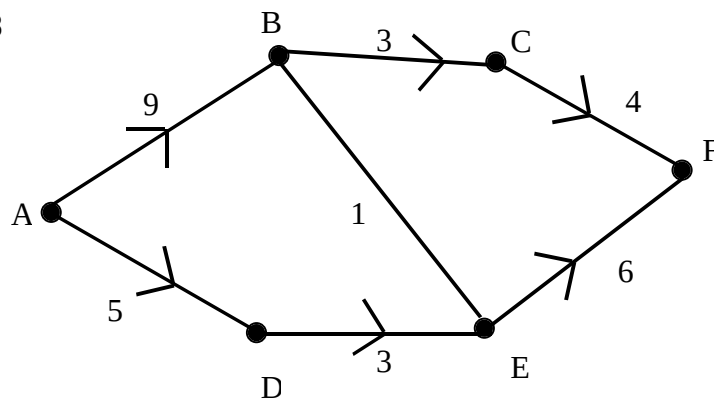
D.

$$\begin{vmatrix} 1 & 2 & 1 & 0 \\ 1 & 0 & 2 & 0 \\ 2 & 2 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{vmatrix}$$

E.

$$\begin{vmatrix} 1 & 1 & 2 & 0 \\ 1 & 1 & 2 & 0 \\ 2 & 2 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{vmatrix}$$

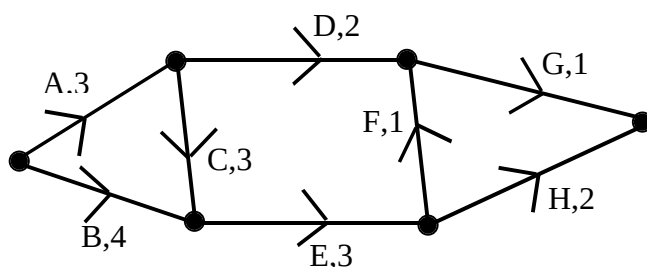
Question 8



The minimum cut capacity for the graph above is

- A. 3
- B. 4
- C. 7
- D. 8
- E. 9

Question 9



The time in hours required for each of eight activities in cleaning a house are listed on the above graph. The float time for activity G in hours is

- A. 0
- B. 1
- C. 2
- D. 9
- E. 11

END OF MULTIPLE-CHOICE QUESTION BOOK

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