Neap:

Trial Examination 2018

VCE Further Mathematics Units 3&4

Written Examination 1

Multiple-choice Question Booklet

Reading time: 15 minutes
Writing time: 1 hour 30 minutes

Student's Name: _____

Teacher's Name: _____

Structure of booklet

Section	*Number of questions*	*Number of questions to be answered*	*Number of modules*	*Number of modules to be answered*	*Number of marks*
A – Core	24	24			24
B – Modules	32	16	4	2	16
					Total 40

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners, rulers, one bound reference, one approved technology (calculator or software) and, if desired, one scientific calculator. Calculator memory DOES NOT need to be cleared. For approved computer-based CAS, full functionality may be used.

Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.

Materials supplied

Question booklet of 27 pages

Formula sheet

Answer sheet for multiple-choice questions

Working space is provided throughout the booklet

Instructions

Write your **name** and your **teacher's name** on your answer sheet for multiple-choice questions.

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

At the end of the examination

You may keep this question booklet and the formula sheet.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

SECTION A – CORE

Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
Choose the response that is **correct** for the question.
A correct answer scores 1; an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.
Unless otherwise indicated, the diagrams in this booklet are **not** drawn to scale.

Data analysis

Question 1

An average figure of 3.2 is quoted for a set of data.

Which one of the following does it represent?

A. mean of 3.0, 3.2, 3.2, 3.2, 4.0, 6.0
B. median of 2.9, 3.0, 3.1, 3.1, 3.4, 3.4, 3.5
C. mode of 3.0, 3.1, 3.2, 3.2, 3.4, 3.4, 3.5, 3.5, 4.0, 4.0
D. range of 0.0, 1.6, 2.5, 3.1, 3.5
E. mean of 4.5, 1.3, 22.0, 3.2, 1.1, 3.2, 5.9 after the outlier is removed

Question 2

Tik's T-Shirt company is only open five days a week. The seasonal indices for the daily sales are shown in the table below.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Seasonal index	0.6	0.4	1.1	1.5	1.4
Actual sales	240	200	440	300	420

On which day does the seasonally adjusted figure show the least sales?

A. Monday
B. Tuesday
C. Wednesday
D. Thursday
E. Friday

Question 3

A categorical set of data is best represented by a

A. scatterplot.
B. histogram.
C. frequency table.
D. stem and leaf plot.
E. time series plot.

Question 4

The results of 95 completed surveys concerning the relocation of the local sports club are shown in this two-way frequency table.

Note: The figures show the number of respondents who voted yes or no to the proposal in each age group.

Age group	Male (yes / no)	Female (yes / no)
10–20	6 / 4	4 / 2
20–30	6 / 4	10 / 4
30–50	8 / 1	5 / 5
>50	15 / 1	6 / 14

Which of the following is true?

A. The highest percentage of yes votes was in the >50 age group.
B. 65 people voted yes.
C. 60% of males in the 20–30 age group voted yes.
D. Both male and female voters had more than a 50% yes vote.
E. 35 males completed the survey.

Question 5

This back-to-back stem plot below displays the *ages* and *gender* of patients seen by a doctor over a week.

key: 1|6 = 16 *age* (years)

male						female					
		8	5	1	1	0	1	1	5	6	
				9	3	1	3	4	6		
				5	1	2	2	2			
				4	2	3	6	8			
		8	7	6	4	4	5	6	6	6	8
7	7	6	4	3	1	5	4	4	5	5	7	9
		9	8	7	5	6	2	4	5	5	5	8
	9	4	4	3	2	7	2	6	7	8		

Which one of the following is true?

A. The oldest person who attended is 78 years of age.
B. The data for female ages has a greater range.
C. The figures for both sexes are symmetrical.
D. The median of both data sets is 51 years of age.
E. There is no mode for males, but the mode for females is 46 years of age.

Question 6

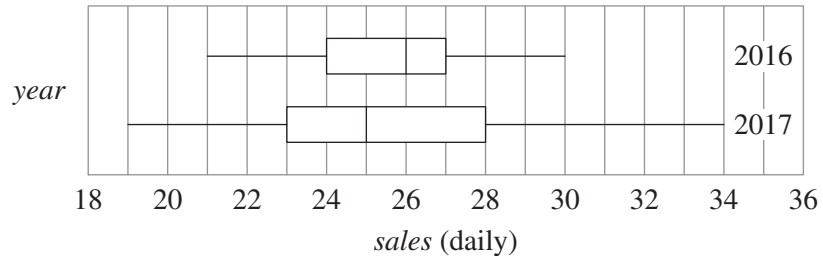
The correlation coefficient for two variables x and y is calculated to be -0.6.

Which one of the following is true?

A. There is a strong, negative, linear correlation between the variables.
B. 60% of the variation in y is due to the variation in x.
C. The gradient is -0.6.
D. The two variables have opposite signs.
E. As x increases, the value of y decreases.

Question 7

The parallel boxplots shown below represent the daily *sales* made by a company in the years 2016 and 2017.



Which one of the following must be true?

A. The data for 2017 is negatively skewed.
B. The mean for 2017 is less than the mean for 2016.
C. Sales improved in 2017.
D. The IQR is greater for the 2017 data.
E. 2016 has a greater range.

Question 8

A machine produces bolts with a mean length of 4.0 cm and a standard deviation of 3 mm.

Assuming the length of the bolt is normally distributed, 95% of the bolts will be between

A. 1–7 cm
B. 3.7–4.3 cm
C. 3.1–4.9 cm
D. 34–46 mm
E. 37–46 mm

Use the following information to answer Questions 9 and 10.

The temperatures at 10 am and 4 pm were collected for a selection of Australian cities and towns.

City	Adelaide	Broome	Cairns	Daylesford	Eden	Falls Creek	Geraldton
Temperature at 10 am	14	23	22	12	13	3	32
Temperature at 4 pm	25	33	35	15	18	11	35

Question 9

Using the temperature at 10 am as the explanatory variable, the coefficient of determination for this data

A. is closest to $y = -4.1 + 0.9x$.

B. is closest to $y = 7.9 + x$.

C. is closest to 0.84.

D. is closest to 0.92.

E. cannot be calculated due to the small data set.

Question 10

Upon rechecking the data it is found that the 4 pm temperature for Daylesford was incorrectly recorded and should have been 25. (Note: Do not change your answer for **Question 9**.)

Which one of the following statements best describes the effect on the univariate statistics for the temperature at 4 pm?

A. The five-number summary will not change.

B. The IQR will slightly decrease.

C. Both the mean and median will slightly increase.

D. The only change is the mean will slightly increase.

E. Both the IQR and mean will increase.

Question 11

The following experimental data was recorded.

x	0.1	0.2	0.3	0.4	0.5	0.6
y	9	5	4	3	2	1

After a $\frac{1}{x}$ transformation is applied, the correlation coefficient is

A. –0.94

B. –0.62

C. 0.89

D. 0.96

E. 0.98

Question 12

Consider the frequency table below.

x	f
1–5	5
6–10	4
11–15	8
16–20	3
21–25	10

The mean of this discrete data set is estimated to be 14.5.

The median and standard deviation are closest to

A. 5 and 2.9
B. 5 and 7.4
C. 5 and 7.9
D. 13 and 7.4
E. 13 and 7.9

Use the following information to answer Questions 13 and 14.

The following data shows the deliveries made by a distribution centre over eight consecutive quarters.

Quarter (n)	1	2	3	4	5	6	7	8
Mean daily deliveries (d)	125	100	110	170	140	80	120	200

Question 13

The four-point moving mean centred on quarter 4 is

A. 125
B. 127.5
C. 130
D. 140
E. 170

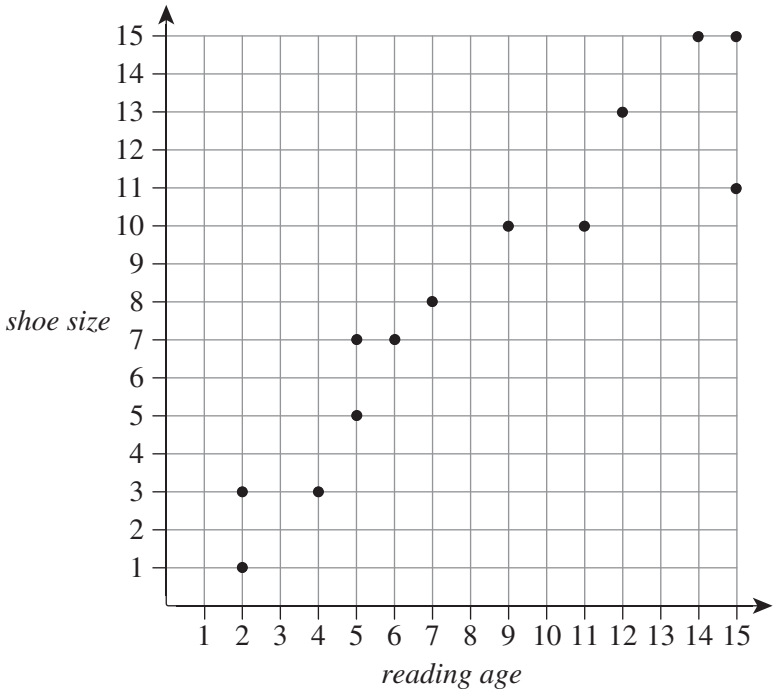
Question 14

Using the trend line equation $d = 104 + 6n$ for the data, an estimate for the mean daily deliveries for the tenth quarter is

A. 120
B. 158
C. 164
D. 195
E. 200

Use the following information to answer Questions 15 and 16.

Data was collected on *reading age* and *shoe size* for a sample of 13 people under the age of 16. The results are shown in this scatterplot.



Question 15

The linear regression equation is *shoe size* = 0.85 + (0.9 × *reading age*).

The residual for the point (15, 11) is closest to

A. –14.35
B. –3.35
C. 3.35
D. 11
E. 14.35

Question 16

The variables *shoe size* and *reading age* have a correlation of about 0.9 for people under 16.

This is best explained by

A. confounding correlation.
B. common response correlation.
C. coincidence correlation.
D. people with larger feet being more intelligent than people with smaller feet.
E. people over 20 not reading as well as people under 20.

Recursion and financial modelling

Question 17

Terms t_1, t_2 and t_3 in the recursive relation $t_{n+1} = 3t_n - 16$, $t_0 = 8$ are

A. –16, –54 and –178.
B. –16, 24 and 32.
C. –13, –52 and –172.
D. 8, 8 and 8.
E. 22, 306 and 3290.

Question 18

Sarisa borrows $410 000 to purchase an apartment. She repays the loan monthly at a rate of 4.5% per annum compounding monthly to repay the debt after 15 years.

Sarisa's monthly repayment is closest to

A. $3136
B. $3815
C. $5355
D. $28 160
E. $276 750

Question 19

A piece of machinery initially cost n_0 dollars. Over the first 5 years it depreciates at an average of 6.4% per annum.

After 3 years, the depreciated value of the machine can be calculated using

A. $n_3 = n_0 \times 1.064^3$
B. $n_3 = n_1 \times 1.64^2$
C. $n_3 = n_0 \times 1.036^3$
D. $n_3 = 3(n_0 \times 0.936)$
E. $n_3 = n_0 \times 0.936^3$

Question 20

Tanya is saving for a two-week holiday in Phuket. She already has $2500 saved and budgets to save $850 a month until $10 000 is reached. She is offered an interest rate of 4.0% per annum compounding quarterly, calculated on the balance at the end of the quarter.

Let B be the balance of her account.

Which one of the following expressions can be used to calculate B after 3 months?

A. $B_1 = (2500 + 850 \times 3) \times 1.0033^3$

B. $B_1 = (2500 + 850 \times 3) \times 1.01$

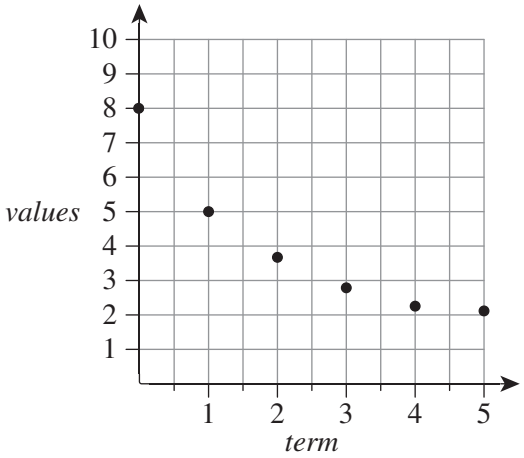
C. $B_1 = (2500 + 850 \times 3) \times 1.01^3 - 2500$

D. $B_3 = (2500 + 850 \times 3) \times 1.04^3$

E. $B_3 = (2500 \times 1.01)^3 + 3 \times 850$

Question 21

The first six points of a recursive relation are plotted on the graph shown below.



The equation of this recursive relation could be

A. $t_{n+1} = \frac{t_n}{2} + 1,\ t_1 = 8$

B. $t_{n+1} = \frac{t_n}{2} + 1,\ t_0 = 8$

C. $t_{n+1} = -0.5t_n + 8$

D. $t_{n+1} = \frac{t_n}{2} + 8,\ t_0 = 1$

E. $t_{n+1} = 2t_n + 1,\ t_0 = 8$

Question 22

Pin invests $50 000 at a flat rate of 3% per annum. She withdraws $5000 each year for expenses.

Which one of the following relationships accurately describes the total value after n years?

A. $t_{n+1} = t_n \times 0.03 - 5000, t_0 = 50\,000$

B. $t_{n+1} = t_n \times 0.03 + 5000, t_0 = 50\,000$

C. $t_{n+1} = t_n \times 1.03 - 5000, t_0 = 50\,000$

D. $t_{n+1} = t_n \times 1.03 + 5000, t_0 = 50\,000$

E. $t_n = 50\,000 \times 1.03^n - 5000n$

Question 23

A credit card company decides to change the interest on outstanding debts from compounding monthly to compounding daily.

For a debt of $3500 at a rate of 12% per annum, which of the following can be used to calculate the difference in interest charged by the company under the new system for a single 30-day month?

A. NA; there will be no change to the interest.

B. $3500\left(1 + \dfrac{\frac{12}{365}}{100}\right)^{30}$

C. $3500\left(1 + \dfrac{1}{100}\right) - 3500\left(1 + \dfrac{\frac{12}{30}}{365}\right)^{30}$

D. $3500\left(1 + \dfrac{\frac{12}{365}}{100}\right)^{30} - 3500\left(1 + \dfrac{1}{100}\right)$

E. $3500\left(1 + \dfrac{\frac{12}{365}}{100}\right)^{30} - 3500\left(1 + \dfrac{\frac{12}{12}}{100}\right)^{30}$

Question 24

A credit card advertises a flat interest rate of 12% per annum, but the reality is that the effective interest rate charged is closer to 20%.

This is because

A. the rate does not include the extra charges.

B. interest is charged on the interest from the previous month as well.

C. the interest is compounding.

D. the repayments do not cover the interest charged, so the balance is increasing.

E. the interest is charged on the original balance, even though it reduces each month.

END OF SECTION A

SECTION B – MODULES

Instructions for Section B

Select **two** modules and answer **all** questions within the modules selected in pencil on the answer sheet provided for multiple-choice questions.

Show the modules you are answering by shading the matching boxes on your multiple-choice answer sheet **and** show the module chosen by marking the appropriate box.

Choose the response that is **correct** for the question.

A correct answer scores 1; an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

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Contents **Page**

Module 1 – Matrices

Before answering these questions, you must **shade** the 'Matrices' box on the answer sheet for multiple-choice questions.

Question 1

Consider the matrix below.

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

The matrix would be best described as

A. diagonal, identity and square.
B. binary, symmetrical and square.
C. diagonal and square.
D. binary, diagonal, identity and square.
E. binary, diagonal, identity, symmetrical and square.

Question 2

The individual costs of a loaf of bread (B) and a litre of milk (M) are shown on matrix P. The weekday orders for each are shown in matrix Q.

$$P = \begin{bmatrix} 2.65 \\ 3.40 \end{bmatrix} \begin{matrix} B \\ M \end{matrix} \qquad Q = \begin{matrix} \\ B \\ M \end{matrix} \begin{bmatrix} \text{M} & \text{T} & \text{W} & \text{Th} & \text{F} \\ 13 & 14 & 10 & 15 & 7 \\ 17 & 12 & 22 & 20 & 18 \end{bmatrix}$$

The income from the sales of milk over the five days is

A. 59
B. 89
C. \$156.35
D. \$302.60
E. \$458.95

Question 3

Consider the two matrices below.

$$\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} S \\ E \\ A \\ L \end{bmatrix}$$

Multiplying these two matrices together gives

A. $\begin{bmatrix} S \\ A \\ L \\ E \end{bmatrix}$

B. $\begin{bmatrix} A \\ E \\ S \\ L \end{bmatrix}$

C. $\begin{bmatrix} A \\ E \\ L \\ S \end{bmatrix}$

D. $\begin{bmatrix} A & E & S & L \end{bmatrix}$

E. $\begin{bmatrix} A & E & L & S \end{bmatrix}$

Question 4

At a local football game, the price of two pies and a can of soft drink is \$14 and the cost of three pies and two soft drinks is \$23. Let p be the cost of a pie and s be the cost of a soft drink.

Writing the simultaneous equations in matrix form gives

A. $\begin{bmatrix} 14 \\ 23 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} 14 \\ 32 \end{bmatrix}$

C. $\begin{bmatrix} 2 & 1 & 14 \\ 3 & 2 & 32 \end{bmatrix}$

D. $\begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} 23 \\ 14 \end{bmatrix} = \begin{bmatrix} p \\ s \end{bmatrix}$

E. $\begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} p \\ s \end{bmatrix} = \begin{bmatrix} 23 \\ 14 \end{bmatrix}$

Question 5

The matrix S_{n+1} is found from S_n using the rule $S_{n+1} = TS_n - B$, where

$$S_0 = \begin{bmatrix} 300 \\ 400 \end{bmatrix}, \; T = \begin{bmatrix} 0.8 & 0.6 \\ 0.5 & 0.9 \end{bmatrix} \text{ and } B = \begin{bmatrix} 50 \\ 60 \end{bmatrix}$$

Matrix S_2 is equal to

A. $\begin{bmatrix} 430 \\ 450 \end{bmatrix}$

B. $\begin{bmatrix} 480 \\ 510 \end{bmatrix}$

C. $\begin{bmatrix} 564 \\ 560 \end{bmatrix}$

D. $\begin{bmatrix} 614 \\ 620 \end{bmatrix}$

E. $\begin{bmatrix} 630 \\ 650 \end{bmatrix}$

Question 6

If $A = \begin{bmatrix} 2w & -x \\ 3y & 4z \end{bmatrix}$, then A^{-1} will be

A. $\begin{bmatrix} 4z & x \\ -3y & 2w \end{bmatrix}$

B. $\frac{1}{8wz - 3xy}\begin{bmatrix} 4z & x \\ -3y & 2w \end{bmatrix}$

C. $\frac{1}{8wz + 3xy}\begin{bmatrix} 4z & x \\ -3y & 2w \end{bmatrix}$

D. $\frac{1}{8wz - 3xy}\begin{bmatrix} 4z & x \\ 3y & 2w \end{bmatrix}$

E. $\frac{1}{8wz + 3xy}\begin{bmatrix} 4z & x \\ 3y & 2w \end{bmatrix}$

Question 7

A newsagency sells three different fashion magazines; *Asif* (*A*), *Brilliant* (*B*) and *Cinderella* (*C*). In the first week they sell a total of 140 magazines; 40, 50 and 50 respectively. The transition matrix below shows how the sales of the different magazines changes each week.

$$T = \begin{bmatrix} 0.2 & 0.5 & 0.3 \\ 0.2 & 0.1 & 0.3 \\ 0.6 & 0.4 & 0.4 \end{bmatrix} \begin{matrix} A \\ B \\ C \end{matrix}$$

Using this information alone, it can be concluded that, in the long term,

A. the newsagency will continue to sell 140 magazines each week.

B. the number of people buying *Cinderella* will stay constant.

C. the total number of people buying *Asif* or *Cinderella* will remain constant.

D. eventually the most popular magazine will be *Asif*.

E. *Brilliant* sales will increase overtime.

Question 8

Matrix *A* has two rows and three columns, matrix *B* has three rows and one column, and matrix *C* has one row and three columns.

The product matrix *ABC*

A. cannot be found.

B. will have two rows and two columns.

C. will have two rows and three columns.

D. will have three rows and one column.

E. will have three rows and two columns.

END OF MODULE 1

Module 2 – 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

For a graph with 11 vertices to be connected, the minimum number of edges is

A. 6
B. 10
C. 11
D. 22
E. 110

Question 2

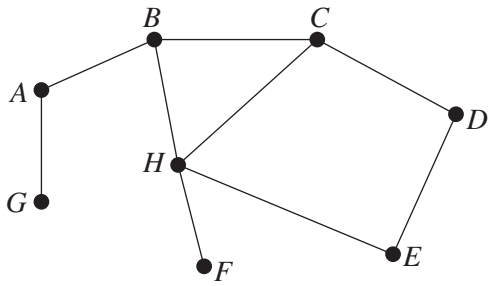
A connected, planar graph is such that the number of faces is twice the number of vertices. The graph has 22 edges.

The number of faces is

A. 8
B. 10
C. 12
D. 16
E. 20

Use the following information to answer Questions 3 and 4.

Consider the graph shown.



Question 3

Which one of the following statements is true regarding this graph?

A. The graph is a tree.
B. The graph is not connected.
C. The graph contains a Hamiltonian circuit.
D. The graph contains exactly one Hamiltonian path.
E. The graph contains more than one Hamiltonian path.

Question 4

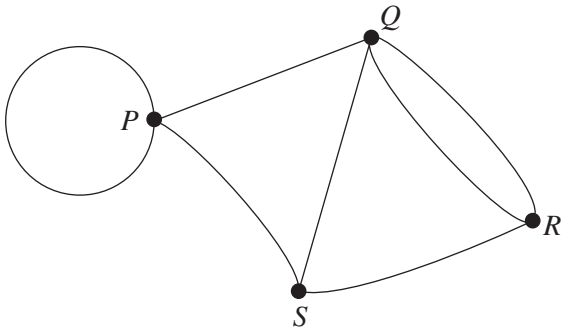
An Eulerian trail is created by adding one edge.

Which one of the following edges could **not** be added in order to create an Eulerian trail?

A. *BG*
B. *GH*
C. *GF*
D. *BF*
E. *BC*

Question 5

The adjacency matrix of the graph below contains 16 elements.

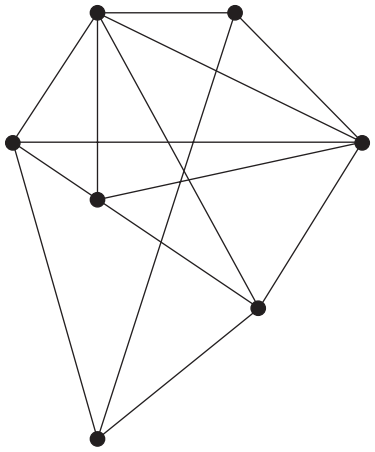


Of these elements,

A. fourteen are ‘1’ and two are ‘2’.
B. five are ‘0’, seven are ‘1’ and four are ‘2’.
C. five are ‘0’and eleven are ‘1’.
D. six are ‘0’, seven are ‘1’ and three are ‘2’.
E. five are ‘0’, nine are ‘1’ and two are ‘2’.

Question 6

The graph shown below is not a planar graph.

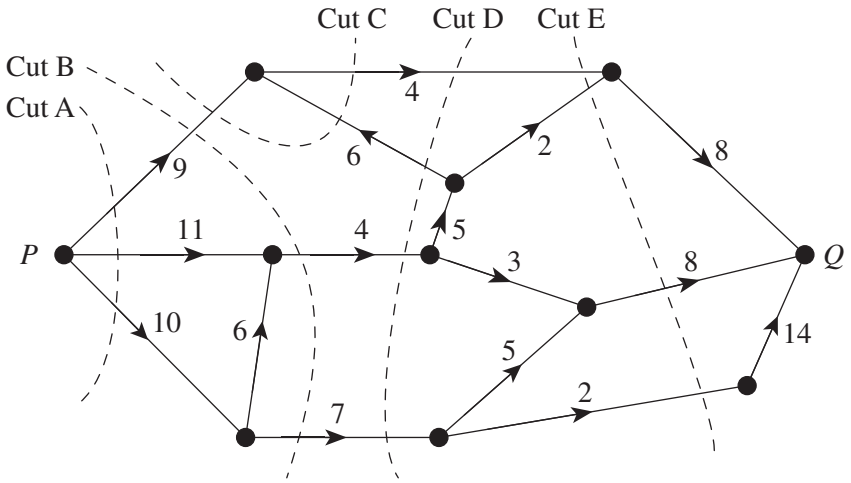


The minimum number of edges that need to be removed in order for the graph to be planar is

A. 1
B. 2
C. 3
D. 4
E. 5

Question 7

For the following network, the values on the edges give the maximum flow between nodes in the direction of the arrows. Five cuts labelled A–E are as shown, one of which gives the maximum flow for the network from *P* to *Q*.



The maximum flow is

A. 13
B. 15
C. 16
D. 20
E. 30

Question 8

A project has activities with predecessors as given in the table below.

Activity	Predecessor	Earliest start time
A	none	0
B	none	0
C	*A*	10
D	*B*	17
E	*C*	24
F	*D*, *E*	35

The time taken to complete activity *E* is 4 hours.

The number of hours that the time taken for activity *C* could be increased by, without delaying the overall completion time for the project, is

A. 0
B. 6
C. 7
D. 9
E. 25

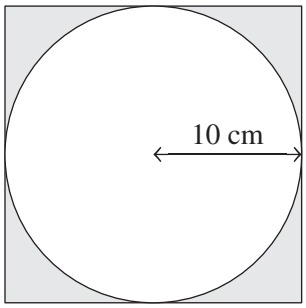
END OF MODULE 2

Module 3 – Geometry and measurement

Before answering these questions, you must **shade** the 'Geometry and measurement' box on the answer sheet for multiple-choice questions.

Question 1

The diagram below shows a circle of radius 10 cm enclosed by a square with side length 20 cm.

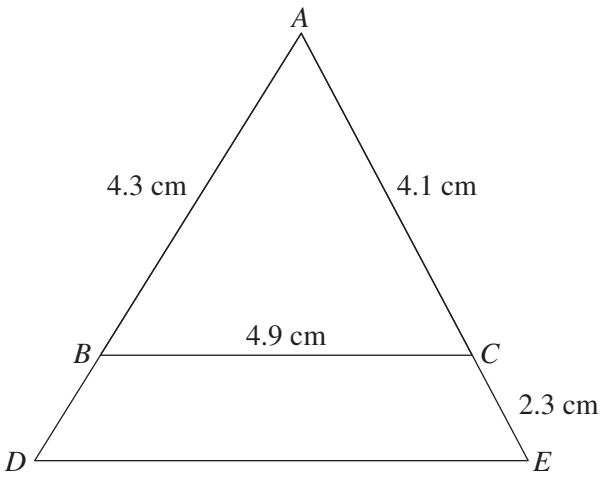


The shaded area, in square cm, is closest to

A. 63
B. 86
C. 300
D. 314
E. 400

Question 2

Two similar triangles are shown in the diagram below, where $AB = 4.3$ cm, $AC = 4.1$ cm, $BC = 4.9$ cm and $CE = 2.3$ cm.

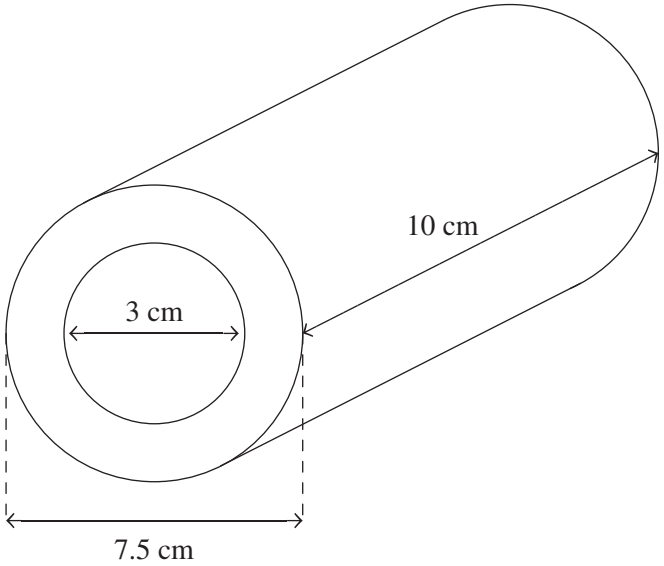


The length of DE, in centimetres, is closest to

A. 7.7
B. 5.4
C. 7.9
D. 7.6
E. 8.8

Question 3

A cylindrical pipe that has been wrapped in a layer of insulating material, forming a larger cylinder, is shown in the diagram below.

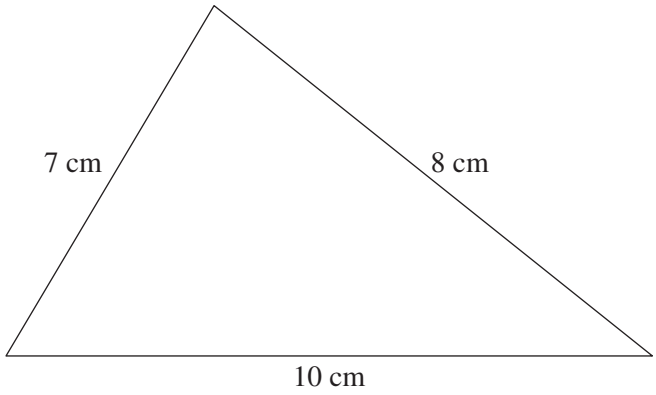


The volume of the insulating material, in cubic metres, is closest to

A. 71
B. 473
C. 371
D. 118
E. 442

Question 4

Consider the diagram of a triangle below.

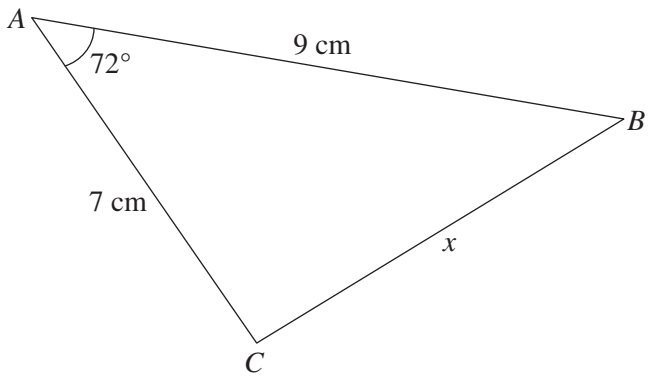


What is the area of the triangle to the closest square centimetre?

A. 28
B. 83
C. 93
D. 177
E. 339

Question 5

The digram below shows a triangle with one side length marked x.



Which one of the following calculations will result in the correct value for x?

A. $7^2 + 9^2 - 2 \times 7 \times 9 \times \cos(72°)$

B. $7^2 - 9^2 + 2 \times 7 \times 9 \times \cos(72°)$

C. $\sqrt{7^2 + 9^2 + 2 \times 7 \times 9 \times \cos(72°)}$

D. $\sqrt{7^2 - 9^2 + 2 \times 7 \times 9 \times \cos(72°)}$

E. $\sqrt{7^2 + 9^2 - 2 \times 7 \times 9 \times \cos(72°)}$

Question 6

Edward is in Geelong (38° S, 144° E). Matilda is in Auckland (38° S, 174° E). Edward needs to call Matilda as the sun sets in Auckland. The sun is due to set at 8.05 pm on this day in February.

What time should Edward call Matilda?

A. 6.05 pm

B. 7.05 pm

C. 8.05 pm

D. 9.05 pm

E. 10.05 pm

Question 7

A spherical object has a volume of 8000 cm^3.

The diameter of the sphere to the nearest centimetre is

A. 25

B. 26

C. 50

D. 51

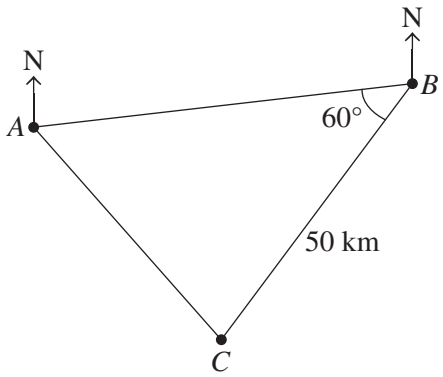
E. 100

Question 8

Some information about three towns is given below.

- Town *B* is 50 km away from town *C*.
- Town *C* is on a bearing of 200° from town *B*.
- Town *B* is on a bearing of 080° from town *A*.
- Town *C* is on a bearing of 150° from town *A*.

A map showing this information is shown below.



What is the distance to town *A* from town *B* to the nearest kilometre?

A. 40
B. 41
C. 44
D. 61
E. 62

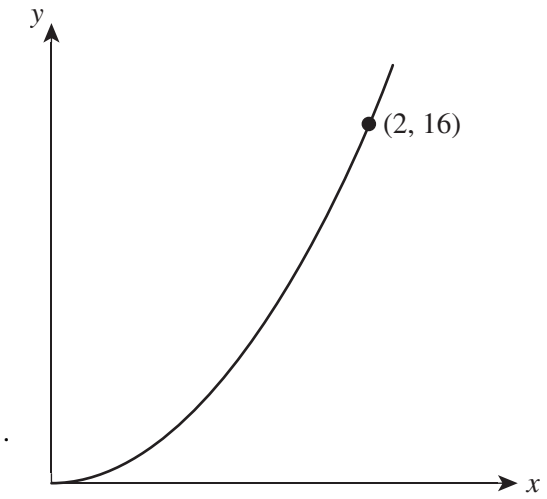
END OF MODULE 3

Module 4 – 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 point (2, 16) lies on the graph of $y = kx^2$, as shown below.



The value of k is

A. 1
B. 2
C. 4
D. 0.25
E. 0.5

Question 2

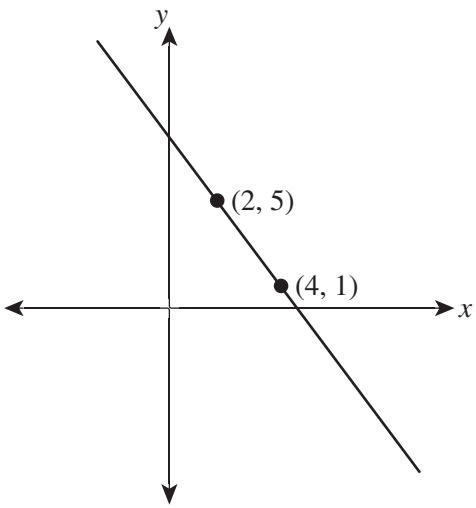
A ski resort charges a resort entry fee of $70 and an additional $55 per day to use the ski lifts.

If n is the number of days spent at the resort and C is the total cost of the visit to the resort, what is the equation for the relationship between n and C?

A. $C = 55 + 70n$
B. $C = 70 + 55n$
C. $C = 125n$
D. $C = 70(n + 55)$
E. $C = 55 + (70 + n)$

Question 3

The graph below has two known points, but the equation is unknown.



The coordinates of the x-axis intercept are

A. (9, 0)
B. (0, 9)
C. (5, 0)
D. (4.5, 0)
E. (0, 4.5)

Question 4

Sue is a professional darts player and receives a prize if she wins a game. However, she must pay a match fee if she loses. In January she played 10 games, won 8, and received $440. In February she played 12 games, won 6, and received $150.

If Sue plays 9 games in March, what is the smallest number of games she needs to win to break even?

A. 2
B. 3
C. 4
D. 5
E. 6

Question 5

The point (–5, 2) satisfies which of the following inequalities?

A. $x + 2y \leq 0$
B. $y < x$
C. $x - y \geq 1$
D. $y \geq 2 - \frac{x}{5}$
E. $x > 0$

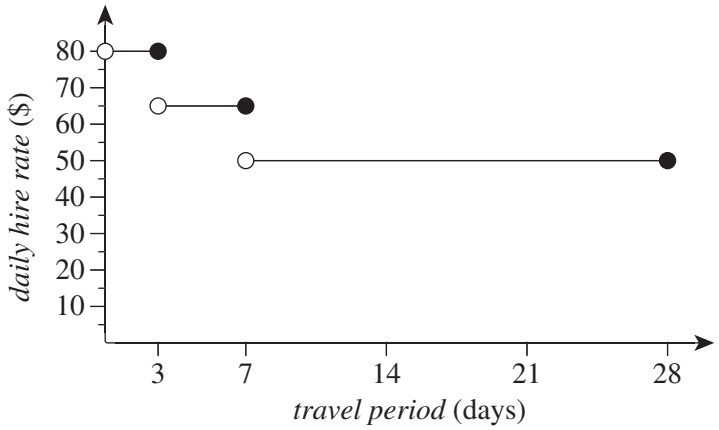
Question 6

The equation of the line that passes through the points (–2, 10) and (2, –2) is

A. $y = -4x + 3$
B. $y = -4x - 3$
C. $y = -3x + 4$
D. $y = -3x - 4$
E. $y = 3x - 4$

Question 7

Two travellers are organising car hire for a road trip. The *daily hire rate* is lower for longer *travel periods* as indicated on the graph shown below.



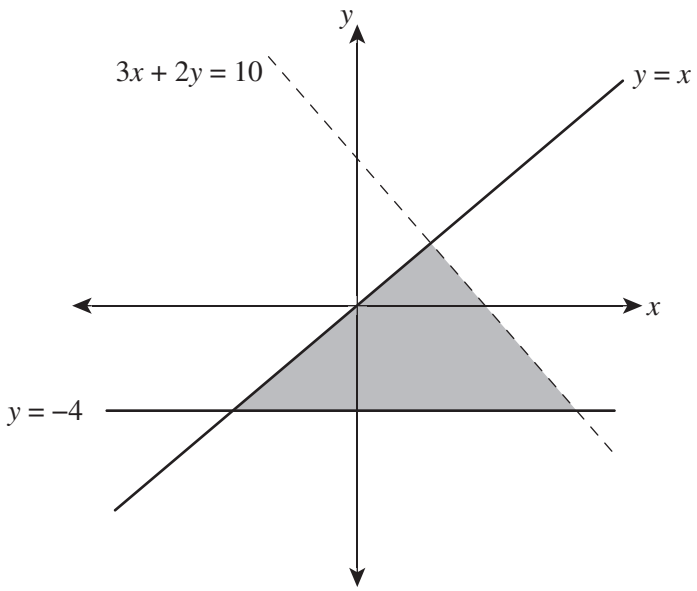
Tom needs to hire a car for 6 days and Holly needs to hire a car for 15 days.

What is the total car hire cost for both travellers?

A. $145
B. $1050
C. $1140
D. $1275
E. $1335

Question 8

The graph below shows a shaded region between the graphs of $y = x$, $3x + 2y = 10$ and $y = -4$.



Which one of the following inequalities does the shaded region best satisfy?

A. $y < x$
$3x + 2y > 10$
$y \geq -4$

B. $y \leq x$
$3x + 2y > 10$
$y < -4$

C. $y < x$
$3x + 2y \leq 10$
$y < -4$

D. $y \leq x$
$3x + 2y > 10$
$y \leq -4$

E. $y \leq x$
$3x + 2y < 10$
$y \geq -4$

END OF MULTIPLE-CHOICE QUESTION BOOKLET