

2026 HSC SIMULATED EXAMINATION

Mathematics Standard 2

Deconstruction

General Instructions

- Reading time – 10 minutes
- Working time – 2 hours
- Write using a black pen
- Calculators approved by NESA may be used
- A reference sheet is provided at the back of this paper.
- For questions in Section II, show relevant mathematical reasoning and/or calculations

Total Marks:
80

Section I – 10 marks

- Attempt Questions 1-10
- Allow about 20 minutes for this section

Section II – 70 marks

- Attempt Questions 11-31
- Allow about 1 hour and 40 minutes for this section

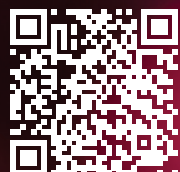


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- B Communication
- B Screen Media (Arts and Production)
- B Education (Primary)
- B Education (Secondary)
- B Arts
- B Arts (Interpreting and Translation)
- B Laws
- B Performing Arts (Acting)
- B Music
- B Design (Visual Communication)
- B Music
- B International Studies

YOU LOVE STUDIES OF RELIGION? *WHY NOT STUDY:*

- B Arts
- B Social Science
- B Education (Primary)
- B Education (Secondary)

YOU LOVE HISTORY? *WHY NOT STUDY:*

- B Arts
- B International Studies
- B Social Science
- B Education (Primary)
- B Education (Secondary)
- B Tourism and Event Management
- B Planning (Pathway to M Urban Management and Planning)

YOU LOVE VISUAL ARTS? *WHY NOT STUDY:*

- B Architectural Design
- B of Design
- B of Design and Technology
- B of Industrial Design (Honours)

YOU LOVE BUSINESS STUDIES? *WHY NOT STUDY:*

- B Business
- B Accounting
- B Education (Primary)
- B Education (Secondary)
- B Tourism and Event Management
- B Construction Management (Honours)

YOU LOVE LEGAL STUDIES? *WHY NOT STUDY:*

- B Criminology
- B Criminal and Community Justice
- B Cyber Security and Behaviour
- B Policing
- B Laws
- B Social Science
- B Humanitarian and Development Studies
- B Education (Primary)
- B Education (Secondary)
- B Construction Management (Honours)
- B Social Work
- B Youth Work

YOU LOVE COMMUNITY AND FAMILY STUDIES STUDIES? *WHY NOT STUDY:*

- B Arts
- B Criminology
- B Nursing
- B Midwifery
- B Psychology (Honours)
- B Psychological and Social Sciences
- B Social Science
- B Youth Work
- B Social Work
- B Humanitarian and Development Studies
- B Education (Early Childhood)
- B Education (Primary)
- B Education (Secondary)

YOU LOVE PHYSICS? *WHY NOT STUDY:*

- B Science
- B Education (Primary)
- B Education (Secondary)
- B Engineering
- B Architectural Design
- B Industrial Design (Honours)
- B Design and Technology

YOU LOVE CHEMISTRY? *WHY NOT STUDY:*

- B Science
- B Medical Science
- B Education (Primary)
- B Education (Secondary)

YOU LOVE HEALTH AND MOVEMENT SCIENCE? *WHY NOT STUDY:*

- B Health Science
- B Health, Physical Education and Sport
- B Exercise Physiology
- B Exercise Science
- B Sport and Performance Science
- B Occupational Therapy
- B Paramedicine
- B Physiotherapy
- B Podiatric Medicine
- B Speech Pathology
- B Traditional Chinese Medicine
- B Nursing
- B Midwifery
- B Education (Primary)

YOU LOVE MATHEMATICS? *WHY NOT STUDY:*

- B Computer Science
- B Data Science
- B Information and Communication Technology
- B Information Systems
- B Mathematics
- B Engineering
- B Education (Primary)
- B Education (Secondary)
- B Planning (Pathway to M Urban Management and Planning)
- B Accounting

YOU LOVE BIOLOGY? *WHY NOT STUDY:*

- B Health Science
- B Health, Physical Education and Sport
- B Occupational Therapy
- B Paramedicine
- B Physiotherapy
- B Podiatric Medicine
- B Speech Pathology
- B Sport and Performance Science
- B Traditional Chinese Medicine
- B Science
- B Medical Science
- B Nursing
- B Midwifery
- B Education (Primary)
- B Education (Secondary)
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Section I

10 marks

Attempt Questions 1-10

Allow about 20 minutes for this section

Use the multiple-choice answer sheet for Questions 1-10

1. Katie earns \$32 per hour. Her hourly pay rate increases by 3%.

How much will she earn for a 5-hour shift with this increase?

- (A) \$4.80
- (B) \$32.98
- (C) \$160
- (D) \$164.80

$$\begin{aligned}\text{New Wage} &= 32 \times 5 \times 1.03 \\ &= \$164.80\end{aligned}$$

2. What is 2 560 200 km written in standard form, correct to two significant figures?

- (A) 2.56×10^4
- (B) 2.6×10^5
- (C) 2.6×10^6
- (D) 2.56×10^6

$$\begin{aligned}\text{Standard Form} &= 2.560200 \times 10^6 \\ \text{Significant Figures} &= 2.6 \times 10^6\end{aligned}$$

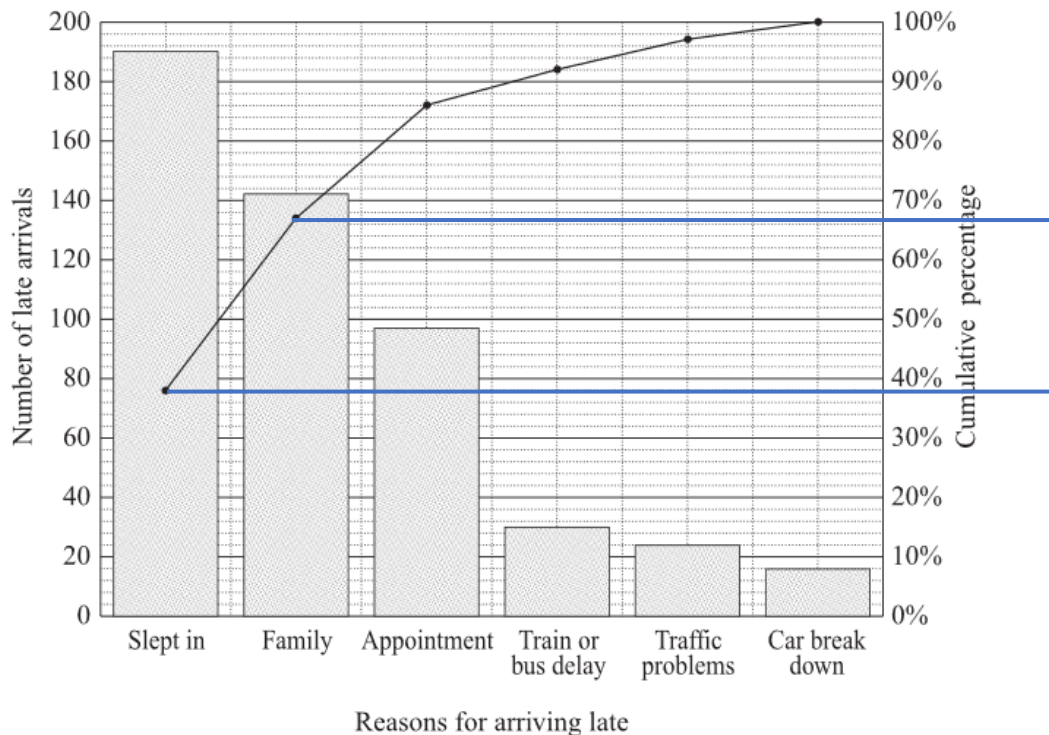
3. Penelope has a credit card. She is charged 0.05% compound interest per day on outstanding balances.

How much interest is Penelope charged on an amount of \$640, which is outstanding on her credit card for 30 days?

- (A) \$9.65
(B) \$9.67
(C) \$649.65
(D) \$649.67

$$\begin{aligned}\text{Interest} &= 640 \left(1 + \frac{0.05}{100} \right)^{30} - 640 \\ &= \$9.67\end{aligned}$$

4. A school collected data related to the reasons given by students for arriving late. The Pareto chart shows the data collected.



What percentage of students gave the reason 'Family'?

- (A) 19%
(B) 29%
(C) 67%
(D) More information required

$$\begin{aligned}\text{Family} &= \text{Family} - \text{Slept In} \\ &= 67 - 38 \\ &= 29\%\end{aligned}$$

5. Each time she throws a dart, the probability that Kylie hits the dartboard is $\frac{3}{7}$.

She throws two darts, one after the other.

What is the probability that she misses the dartboard with both darts?

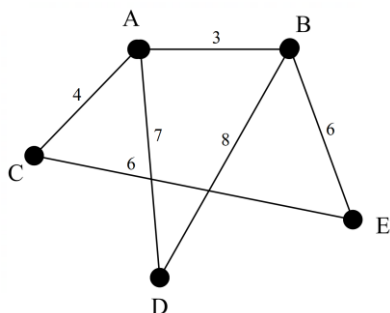
- (A) $\frac{16}{49}$
- (B) $\frac{9}{49}$
- (C) $\frac{8}{21}$
- (D) $\frac{4}{7}$

$$\begin{aligned} P(MM) &= \frac{4}{7} \times \frac{4}{7} \\ &= \frac{16}{49} \end{aligned}$$

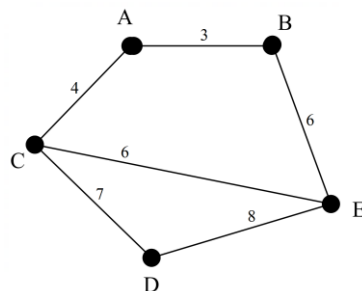
6. Which network diagram is represented by this table?

	A	B	C	D	E
A	-	3	4	-	-
B	3	-	-	8	6
C	4	-	-	7	6
D	-	8	7	-	-
E	-	6	6	-	-

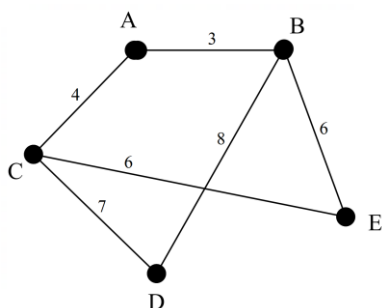
(A)



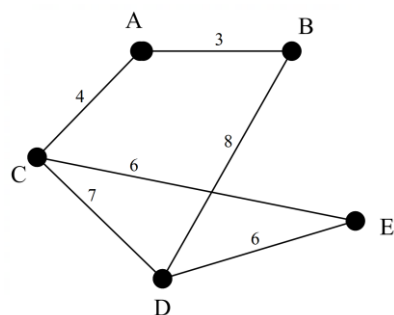
(B)



(C)



(D)



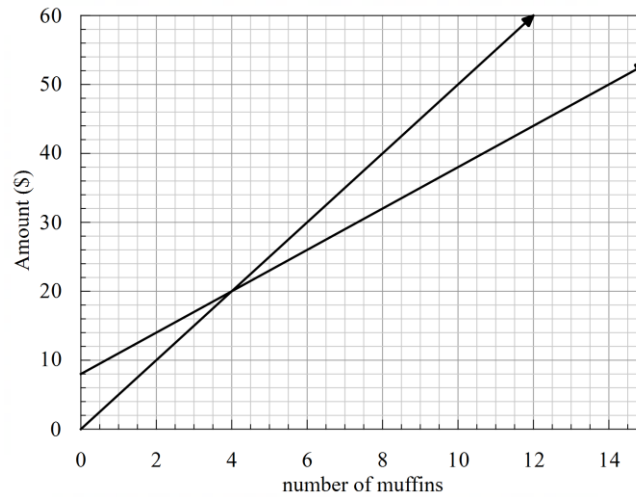
Vertex A requires 2 connections

$\therefore$ Not C

Vertex B requires 3 connections

$\therefore$ Not B or D

7. Ava makes muffins to sell at the weekend markets. The diagram below shows the cost of making the muffins and the income she receives from their sales.



Which of the following statements is true?

- (A) When Ava sells 6 muffins, she breaks even
- (B) Ava's initial cost for making muffins is \$10
- (C) Ava sells each muffin for \$8
- (D) The cost to make each muffin is \$3

Break-even is at 4 muffins

$\therefore$ Not A

Initial Cost is \$8

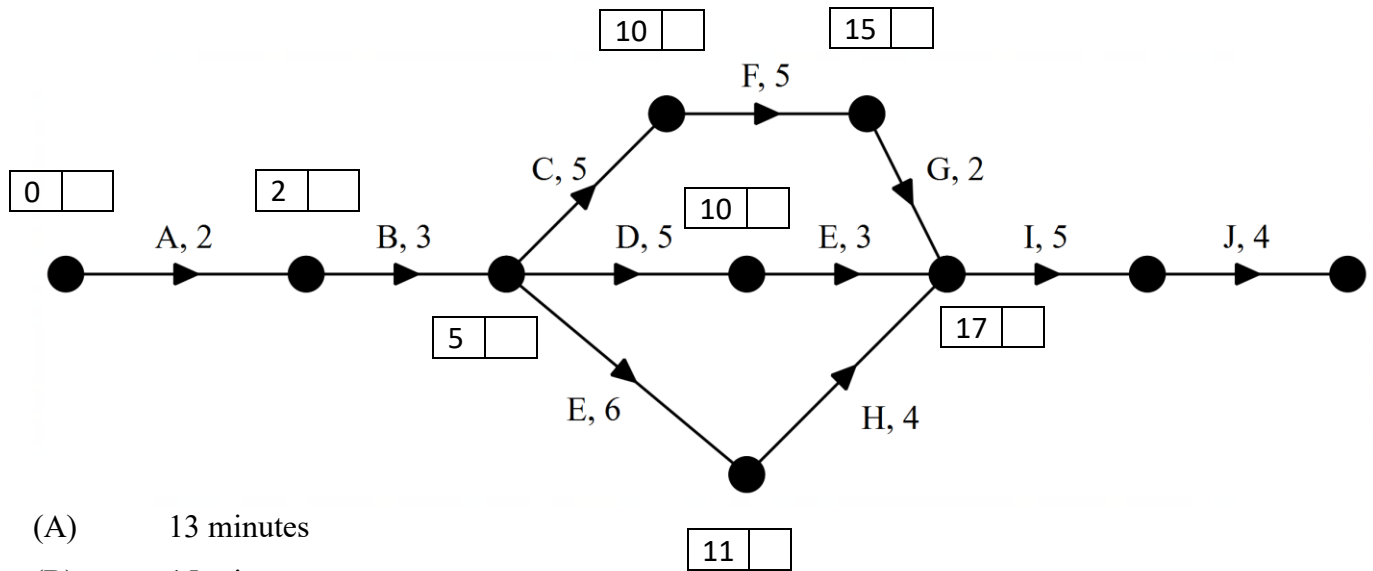
$\therefore$ Not B

Gradient of Revenue graph is $\frac{20}{4} = \$5$

$\therefore$ Not C

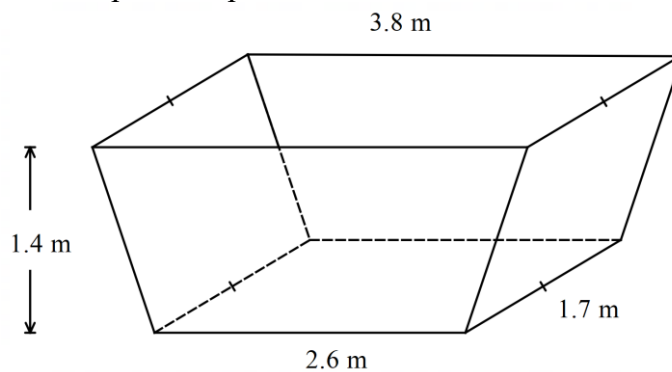
Gradient of Cost graph is $\frac{20 - 8}{4} = \$3$

8. Consider the following network diagram. What is the earliest start time, in minutes, for Activity *I* to commence?



- (A) 13 minutes
- (B) 15 minutes
- (C) 16 minutes
- (D) 17 minutes

9. A skip bin is in the shape of a trapezoidal prism, with dimensions as shown.



What is the volume of the skip bin?

- (A) 7.616 m^3
- (B) 11.7572 m^3
- (C) 15.232 m^3
- (D) 23.5144 m^3

$$V = Ah$$

$$V = \frac{h}{2} (a + b) \times H$$

$$= \frac{1.4}{2} (2.6 + 3.8) \times 1.7$$

$$= 7.616 \text{ m}^3$$

10. The time taken to travel between cities varies inversely with speed. If it takes 8 hours to travel 90 km/h, how long will the same journey take if you travelled at a speed of 75 km/h?
- (A) 6 hours
(B) 6 hours and 40 minutes
(C) 9 hours and 6 minutes
(D) 9 hours and 36 minutes

$$T \propto \frac{1}{S}$$

$$T = \frac{k}{S}$$

$$8 = \frac{k}{90}$$

$$k = 720$$

$$\therefore T = \frac{720}{75}$$

$$= 9.6$$

$$= 9 \text{ hours and } 36 \text{ minutes}$$

End of Section I

Mathematics Standard 2

Section II Answer Booklet

70 marks

Attempt Questions 11-31

Allow about 1 hour and 40 minutes for this section

Instructions

- Answer the questions in the space provided. These spaces provide guidance for the expected length of the response.
- Your responses should include relevant mathematical reasoning and/or calculations.

Please turn over

Question 11 (3 marks)

Cameron earns a yearly salary of \$70 694. His annual leave loading is 17.5% of four weeks' pay.

Calculate his total pay for his four weeks of annual leave.

Criteria	Marks
• Provides correct answer	3
• Makes significant progress towards the answer	2
• Provides correct weekly pay, or equivalent merit	1

Sample answer:

$$\begin{aligned}\text{Weekly Salary} &= 75\,995 \div 52 \\ &= \$1461.44\end{aligned}$$

$$\begin{aligned}4 \text{ Weekly Salary} &= \$1461.44 \times 4 \\ &= \$5845.76\end{aligned}$$

$$\begin{aligned}\therefore \text{Total holiday pay} &= 1.175 \times 5845.76 \\ &= \$6868.77\end{aligned}$$

Question 12 (3 marks)

A rectangular wooden chopping board is advertised as being 18 cm by 34 cm, with each side measured to the nearest centimetre.

- (a) Calculate the percentage error in the measurement of the longer side.

Criteria	Marks
Provides correct solution with or without rounding	1

Sample answer:

$$\begin{aligned}\text{Absolute Error} &= 1 \div 2 \\ &= 0.5\end{aligned}$$

$$\begin{aligned}\text{Percentage Error} &= \frac{0.5}{34} \times 100 \\ &= 1.471\% \text{ (3dp)}\end{aligned}$$

- (b) Between what lower and upper limits does the actual area of the top of the chopping board lie?

Criteria	Marks
Correct numerical expressions	2
Correct calculation of one limit	1

Sample answer:

$$\begin{aligned}\text{Lower Area} &= 17.5 \times 33.5 \\ &= 586.25m^2\end{aligned}$$

$$\begin{aligned}\text{Upper Area} &= 18.5 \times 34.5 \\ &= 638.25m^2\end{aligned}$$

$$\therefore 586.25m^2 \leq \text{Area} < 638.25m^2$$

Question 13 (2 marks)

There are 69 boys and 51 girls in Year 11 at a high school. A stratified random sample is to be selected based on gender.

How many boys and how many girls should be selected for a stratified random sample of 40 students?

Criteria	Marks
• Provides simplified solution for both genders	2
• Provides a solution for one gender	1

Sample answer:

$$\begin{aligned}\text{Boys} &= \frac{69}{120} & \text{Girls} &= \frac{51}{120} \\ &= \frac{23}{40} & &= \frac{17}{40}\end{aligned}$$

∴ 23 boys and 17 girls are required

Question 14 (2 marks)

In a small business, the seven employees earn the following wages per week:

\$150, \$485, \$525, \$590, \$675, \$690, \$990.

Is the wage of \$150 an outlier for this set of data? Justify your answer with calculations.

Criteria	Marks
• Provides correct solution with justification	2
• Calculates the interquartile range, or equivalent merit	1

Sample answer:

Median = 590

$$Q_1 = 485$$

$$Q_3 = 690$$

$$IQR = 690 - 485$$

$$= 205$$

$$485 - 1.5 \times 205 = 997.5$$

$$150 < 177.5$$

$\therefore$ \$150 is an outlier

Question 15 (3 marks)

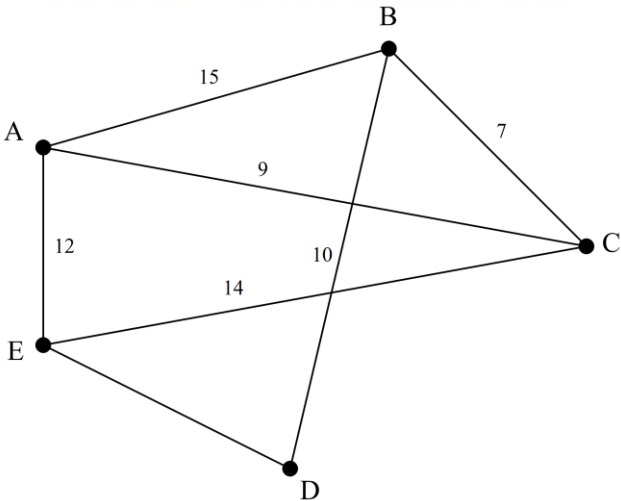
The following table shows the time it takes, in minutes, to walk between 5 stations.

	A	B	C	D	E
A	-	15	9	-	12
B	15	-	7	10	-
C	9	7	-	-	14
D	-	10	-	-	9
E	12	-	14	9	-

(a) Draw this weighted network diagram in the space below.

Criteria	Marks
• Provides an accurate, weighted network diagram	2
• Draws an accurate network diagram	1

Sample answer:



(b) What is the minimum travel time between station A and station D?

1

Criteria	Marks
• Provides correct solution	1

Sample answer:

$12 + 9 = 21 \text{ m}$

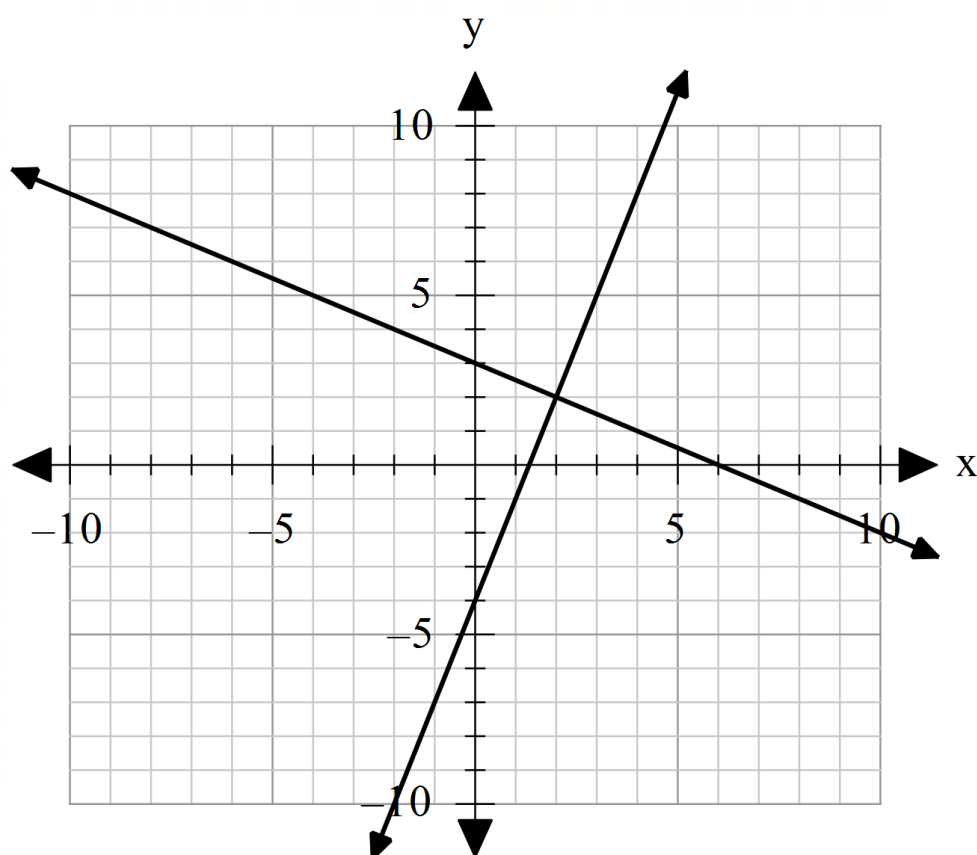
Question 16 (3 marks)

By using a table of values or otherwise, plot the following two equations on the number plane below and find their simultaneous solution.

$$y = 3x - 4 \quad x + 2y = 6$$

Criteria	Marks
• Finds the simultaneous solution	3
• Draws two correct graphs	2
• Draws one correct graph	1

Sample answer:



The simultaneous solution is (2,2)

Question 17 (4 marks)

The formula below is used to calculate an estimate for blood alcohol content (BAC) for males.

$$BAC_{male} = \frac{10N - 7.5H}{6.8M}$$

The number of hours required for a person to reach zero BAC after they stop consuming alcohol is given by the following formula.

$$Time = \frac{BAC}{0.015}$$

The number of standard drinks in full strength beer is 1.6 and in pre-mixed spirits is 1.5.

Justin weighs 86 kg. He consumed 5 full strengths beers and 2 pre-mixed spirits between 8:30 pm and 1:00 am the following day. He then stopped drinking alcohol. Using the given formulae, calculate the time in the morning when Justin's BAC should reach zero.

Criteria	Marks
• Provides correct solution with appropriate calculations	4
• Calculates the correct length of time for BAC to reach zero, or equivalent merit	3
• Calculates the correct BAC, or correct numerical expression	2
• Provides correct values for N or H, or equivalent merit	1

Sample answer:

$$H = 4.5$$

$$N = 5 \times 1.6 + 2 \times 1.5 = 11$$

$$M = 86 \text{ kg}$$

$$BAC = \frac{10 \times 11 - 7.5 \times 4.5}{6.8 \times 86}$$

$$= 0.130386...$$

$$\text{Time to zero} = \frac{0.130386...}{0.015}$$

$$= 8.6924...$$

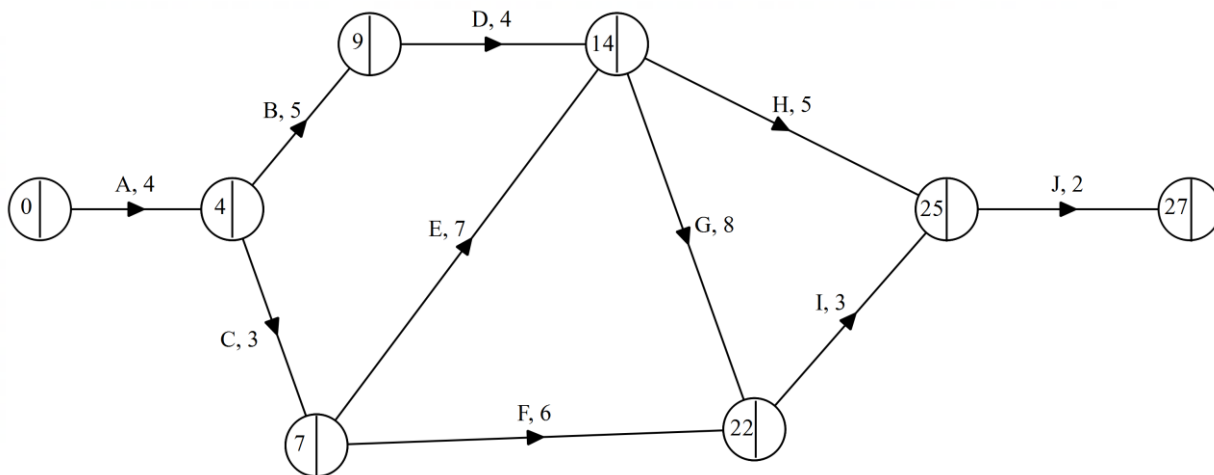
$$= 8 \text{ hours } 42 \text{ min}$$

$$\text{Time zero BAC is reached} = 1:00 \text{ am} + 8 \text{ hours } 42 \text{ min}$$

$$= 9:42 \text{ am}$$

Question 18 (3 marks)

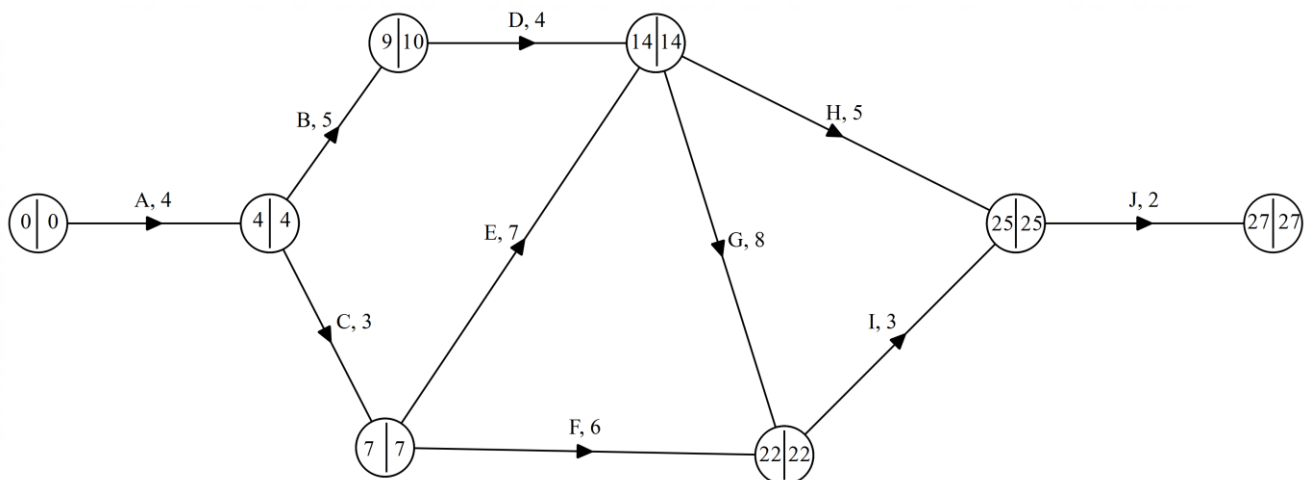
Consider the following directed network diagram. The indicated times are in days.



- (a) Use backwards scanning to complete the latest start times on the above diagram.

Criteria	Marks
Provides correct solution	1

Sample answer:



- (b) What is the float time on Activity *D*?

Criteria	Marks
Provides correct solution	1

Sample answer:

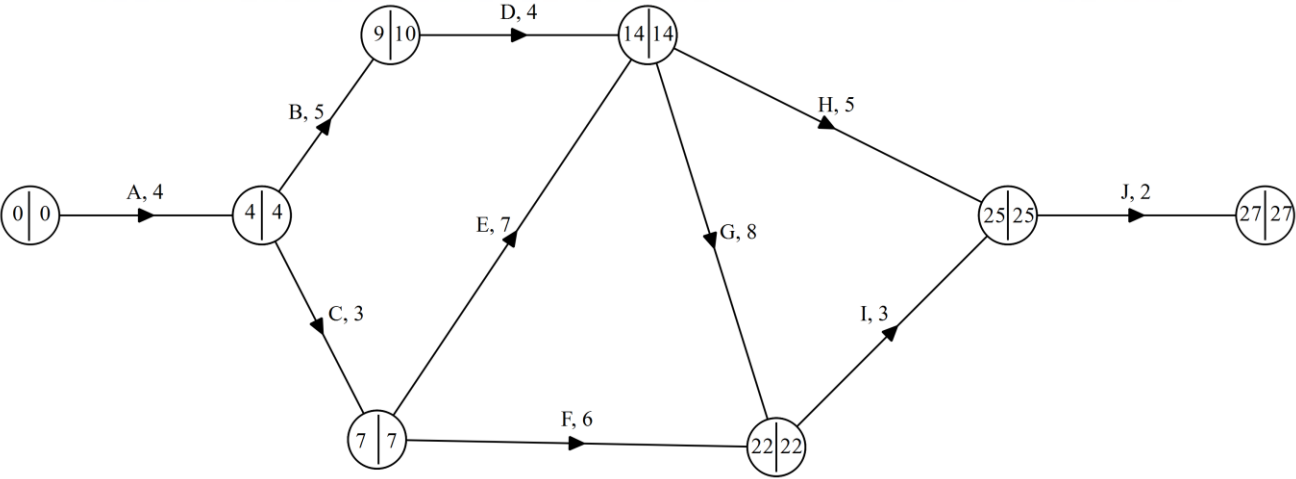
$$10 - 9 = 1$$

The float time for Activity *D* is 1 day

(c) Identify the activities that are on the critical path.

Criteria	Marks
Provides correct solution	1

Sample answer:



The activities that are on the critical path are A - C - E - G - I - J

Question 19 (5 marks)

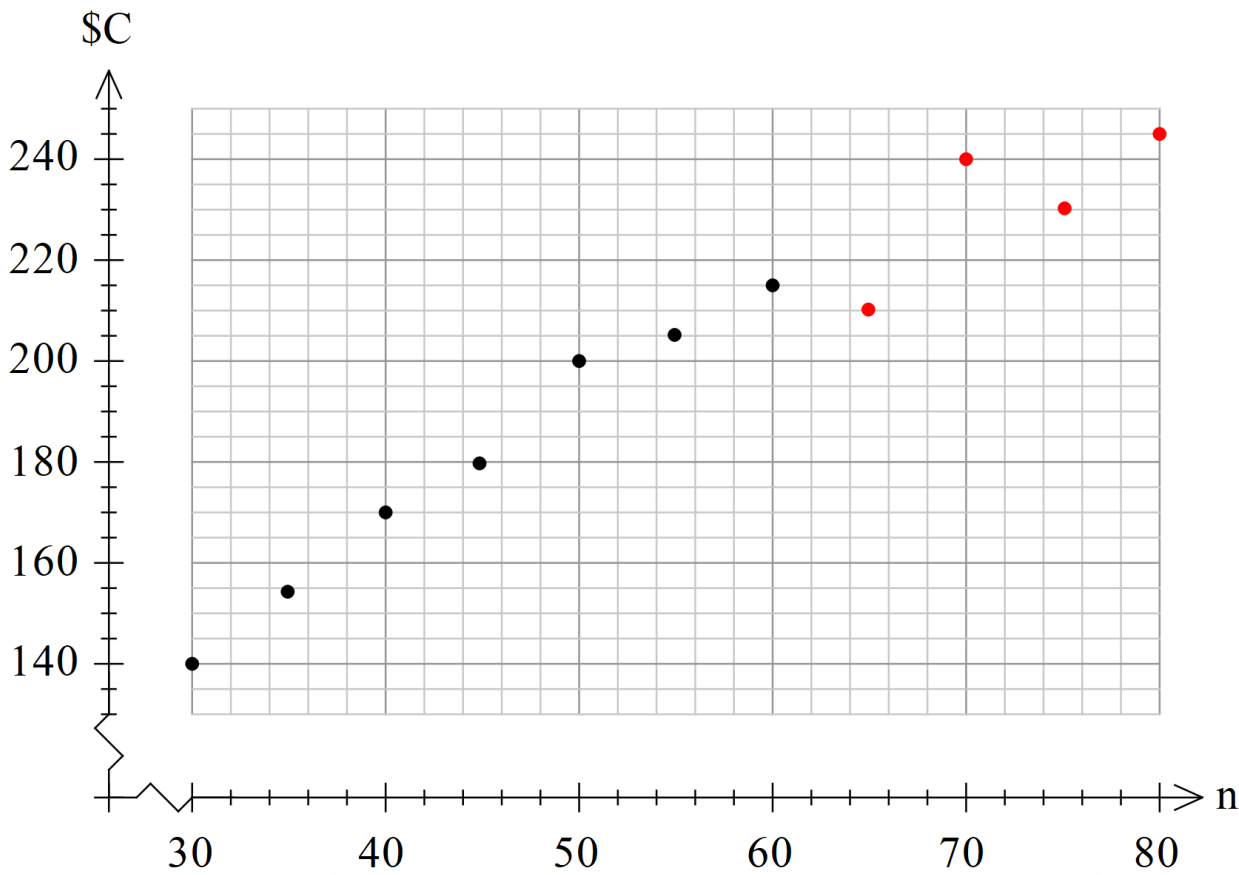
The cost of preparing meals in a school canteen is linearly related to the number of meals prepared. To help the caterers predict the costs, data was collected on the cost of preparing meals for different levels of demands. The data is shown below.

Number of meals (n)	30	35	40	45	50	55	60	65	70	75	80
Cost (\$C)	140	155	170	180	200	205	215	210	240	230	245

(a) Complete the scatterplot below.

Criteria	Marks
• Plots all four points correctly	1

Sample answer:



- (b) Find the equation of the least-squares line of best fit, correct to two decimal places.

Criteria	Marks
• Equation provided with correct context and rounding	2
• Identify m and/or c	1

Sample answer:

$$A = 88.0909.....$$

$$B = 2.0118.....$$

Using $y = mx + c$ and $A + Bx$

$$C = 2.02n + 88.09$$

- (c) Calculate Pearson's correlation coefficient, correct to 2 significant figures.

Criteria	Marks
• Provides correct answer with correct rounding	1

Sample answer:

$$r = 0.97465.....$$

$$\approx 0.97$$

- (d) Describe the direction and strength of the association between the number of meals prepared and the costs.

Criteria	Marks
• Provides correct direction and strength	1

Sample answer:

Positive, strong

Question 20 (2 marks)

A machine produces nails. When the machine is set correctly, the lengths of the nails are normally distributed with a mean of 5.000 cm and a standard deviation of 0.045 cm.

To confirm the setting of the machine, three nails are randomly selected. In one sample the lengths are 5.150, 4.965 and 4.950.

The setting of the machine needs to be checked when the lengths of two or more nails in a sample lie more than 1 standard deviation from the mean.

Does the setting on the machine need to be checked? Justify your answer with suitable calculations.

Criteria	Marks
• Correctly identifies validity of the machine	2
• Identifies upper and/ or lower limit for machine validity	1

Sample answer:

$$\begin{aligned} +1 \text{ Standard deviation} &= 5.000 + 0.045 \\ &= 5.045 \end{aligned}$$

$$\begin{aligned} -1 \text{ Standard deviation} &= 5.000 - 0.045 \\ &= 4.955 \end{aligned}$$

5.150 and 4.950 are outside the limits

$\therefore$ machine needs to be tested

Question 21 (5 marks)

Mike is completing his tax return. He has a gross salary of \$93 750 and income from a rental property totalling \$14 500. He is claiming \$8 720 in allowable deductions.

- (a) Determine Mike's taxable income.

Criteria	Marks
• Provides correct solution	1

Sample answer:

$$\begin{aligned}\text{Taxable income} &= 93\,750 + 14\,500 - 8\,720 \\ &= \$99\,530\end{aligned}$$

- (b) Using the tax table below, calculate Mike's tax payable.

Taxable Income	Tax on this Income
\$0 to \$18 200	Nil
\$18 201 to \$37 000	19c for each \$1 over \$18,200
\$37 001 to \$90 000	\$3,572 plus 32.5c for each \$1 over \$37,000
\$90 001 to \$180 000	\$20,797 plus 37c for each \$1 over \$90,000
\$180 001 and over	\$54,097 plus 45c for each \$1 over \$180,000

Criteria	Marks
• Provides correct solution	2
• Attempts to use correct tax bracket, or equivalent merit	1

Sample answer:

$$\begin{aligned}\text{Tax payable} &= 20\,797 + 0.37(99\,530 - 90\,000) \\ &= \$24\,323.10\end{aligned}$$

(c) In addition to the above tax, Mike must also pay a Medicare levy of \$1990.60.

Mike has already paid \$25 980 as Pay As You Go (PAYG) tax.

Calculate Mike's tax refund or debt. Justify your answer with calculations.

Criteria	Marks
• Provides correct solution with conclusion	2
• Calculates the tax payable including Medicare levy, or equivalent merit	1

Sample answer:

$$\begin{aligned}\text{Total tax payable} &= 24\,323.10 + 1990.60 \\ &= \$26\,313.70\end{aligned}$$

$$25\,980 < 26\,313.70$$

$$\begin{aligned}\text{Difference} &= 26\,313.70 - 25\,980 \\ &= \$333.70\end{aligned}$$

∴ Mark will need to pay \$333.70 more in tax.

Question 22 (3 marks)

Steve purchased 500 company shares at \$3.70 per share. Brokerage fees were 1.5% of the purchase price.

Steve is paid a dividend of 32 cents per share, then immediately sells the shares for \$5.20 each.

If he pays the same brokerage percentage on the sale of his shares, what is Steve's total profit?

Criteria	Marks
• Provides correct solution (no bald answer permitted)	3
• Makes significant progress towards the solution	2
• Makes some progress towards the solution	1

Sample answer:

$$\begin{aligned}\text{Purchase Costs} &= 500 \times 3.70 \\ &= \$1850\end{aligned}$$

$$\begin{aligned}\text{Brokerage at Purchase} &= 0.015 \times 1850 \\ &= \$27.75\end{aligned}$$

$$\begin{aligned}\text{Dividend} &= 0.32 \times 500 \\ &= \$160\end{aligned}$$

$$\begin{aligned}\text{Income at Sale} &= 500 \times 5.20 \\ &= \$2600\end{aligned}$$

$$\begin{aligned}\text{Brokerage at Sale} &= 0.015 \times 2600 \\ &= \$39\end{aligned}$$

$$\begin{aligned}\text{Profit} &= 2600 + 160 - 1850 - 27.75 - 39 \\ &= \$843.25\end{aligned}$$

Question 23 (2 marks)

A scalene triangle has angles in the ratio 9 : 2 : 4.

In degrees, what is the size of its smallest angle?

Criteria	Marks
• Provides correct answer	2
• Calculates an angle other than the smallest angle	1

Sample answer:

$$\begin{aligned}\text{Smallest Angle} &= \frac{2}{15} \times 180 \\ &= 24^\circ\end{aligned}$$

Question 24 (2 marks)

Young's formula, shown below, is used to calculate the dosage of medication for children aged 1–12 years based on the adult dosage.

$$D = \frac{yA}{y + 12}$$

where D = the dosage of the child aged 1-12

y = age of the child (in years)

A = adult dosage

Based on an adult's dosage of 24 mg, a child's dosage is calculated to be 2 mg, three times per day.

Calculate the age of the child in years.

Criteria	Marks
• Provides correct solution with appropriate calculations	2
• Substitutes correctly into Young's formula	1

Sample answer:

$$6 = \frac{24y}{y + 12}$$

$$6(y + 12) = 24y$$

$$6y + 72 = 24y$$

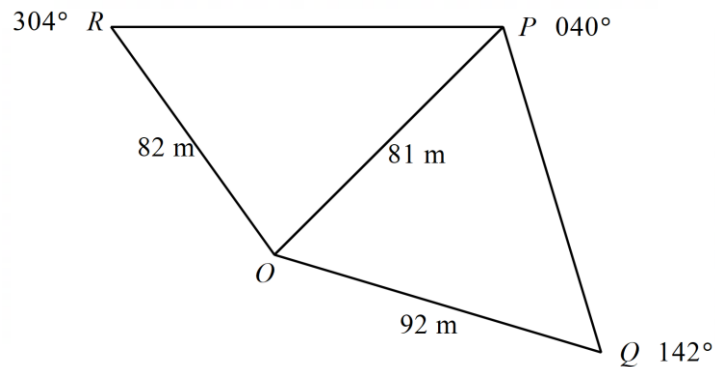
$$18y = 72$$

$$y = 4$$

∴ the child is 4 years old

Question 25 (3 marks)

A radial survey of a park is shown below.



(a) What is the size of $\angle POQ$?

Criteria	Marks
Provides correct answer	1

Sample answer:

$$\begin{aligned}\angle POQ &= 142 - 40 \\ &= 102^\circ\end{aligned}$$

(b) Calculate the length of PQ, correct to the nearest metre.

Criteria	Marks
Provides correct solution	2
Substitutes correctly into cosine rule	1

Sample answer:

$$\begin{aligned}PQ^2 &= 92^2 + 81^2 - 2 \times 92 \times 81 \times \cos(102) \\ &= 18\,123.71584... \\ PQ &= \sqrt{18\,123.71584...} \\ &= 135.624... \\ &\approx 136 \text{ m}\end{aligned}$$

Question 26 (4 marks)

This stem-and-leaf plot shows the time, in hours, that the members of a group of university students spent studying per week.

Stem	Leaf
3	1 6
4	0 1 2 2 5 8 9
5	0 1 1 3 4 7 8 9 9
6	2 3 5 8
7	0 1 1

- (a) Determine the five-number summary of the hours studied.

Criteria	Marks
• Provides correct 5-number summary	2
• Makes significant progress towards solution	1

Lowest Score = 31

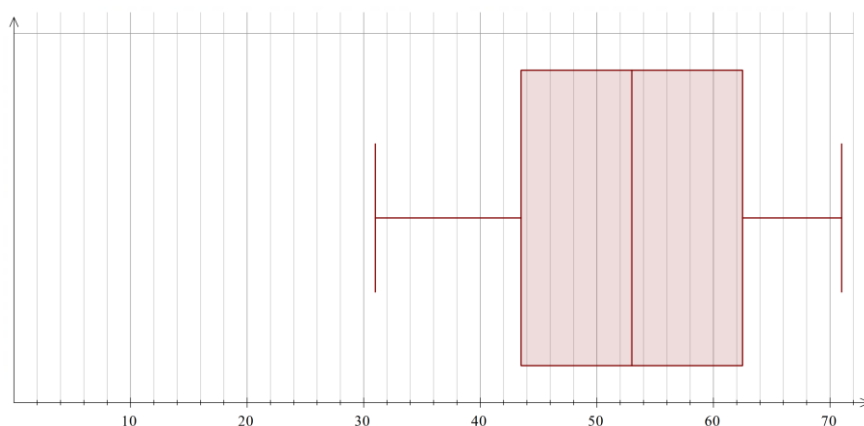
$Q_1 = 43.5$

Median = 53

$Q_3 = 62.5$

Highest Score = 71

- (b) Draw a box-plot to represent this information.

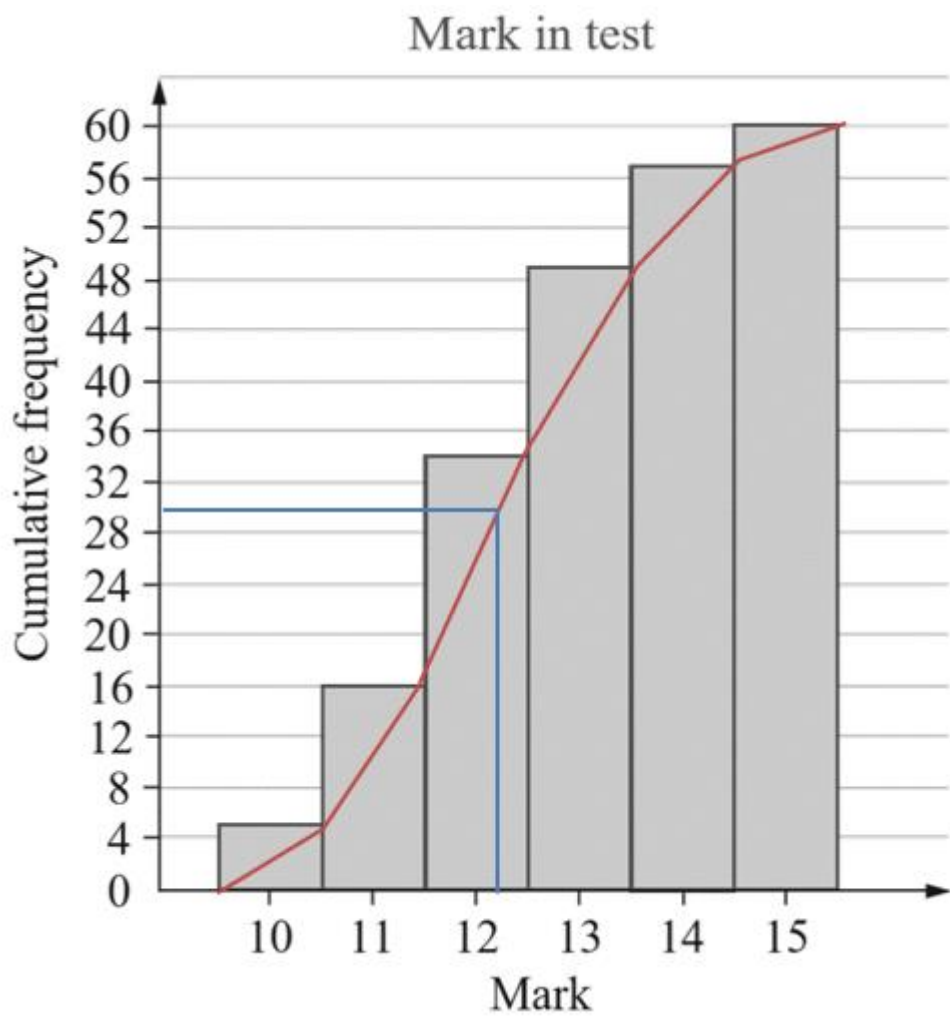


Question 21 (1 mark)

Kyle’s class results for a topic test are displayed in the cumulative frequency histogram below.

Draw the cumulative frequency ogive on the graph above to determine the median score.

Criteria	Marks
Correctly identifies median from completed ogive	1



Question 28 (5 marks)

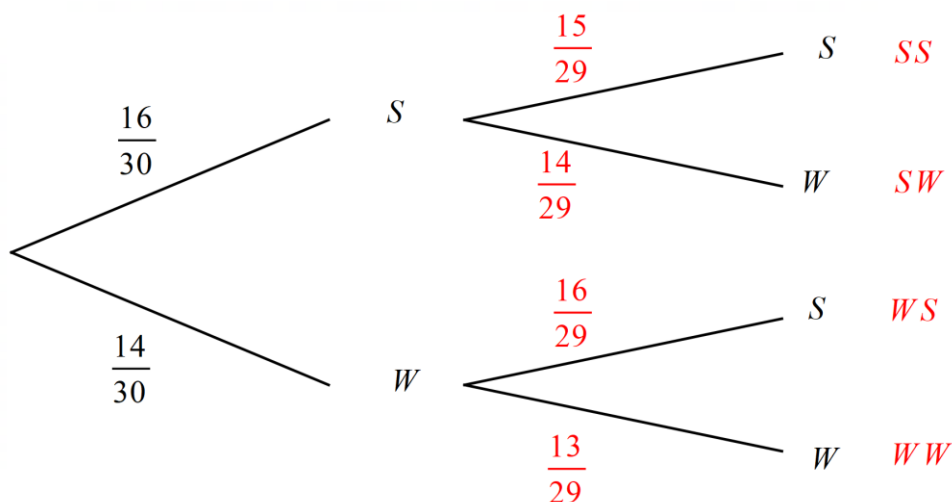
A box contains 30 scarves made from two different fabrics. There are 16 scarves made from satin (S) and 14 made from wool (W).

Two girls each select, at random, a scarf to wear from the box.

- (a) Complete the probability tree diagram.

Criteria	Marks
• Provides all correct probabilities	2
• Provides a minimum of two correct probabilities	1

Sample answer:



- (b) Calculate the probability that the two scarves selected are made from satin.

Criteria	Marks
• Provides correct solution, or equivalent merit	1

Sample answer:

$$\begin{aligned} P(SS) &= \frac{16}{30} \times \frac{15}{29} \\ &= \frac{8}{29} \end{aligned}$$

(c) Calculate the probability that the two scarves selected are made from different fabrics.

Criteria	Marks
• Provides correct solution, or equivalent merit	2
• Makes significant progress towards solution	1

Sample answer:

$$\begin{aligned}P(SW) + P(WS) &= \frac{16}{30} \times \frac{14}{29} + \frac{14}{30} \times \frac{16}{29} \\&= \frac{224}{435}\end{aligned}$$

Question 29 (5 marks)

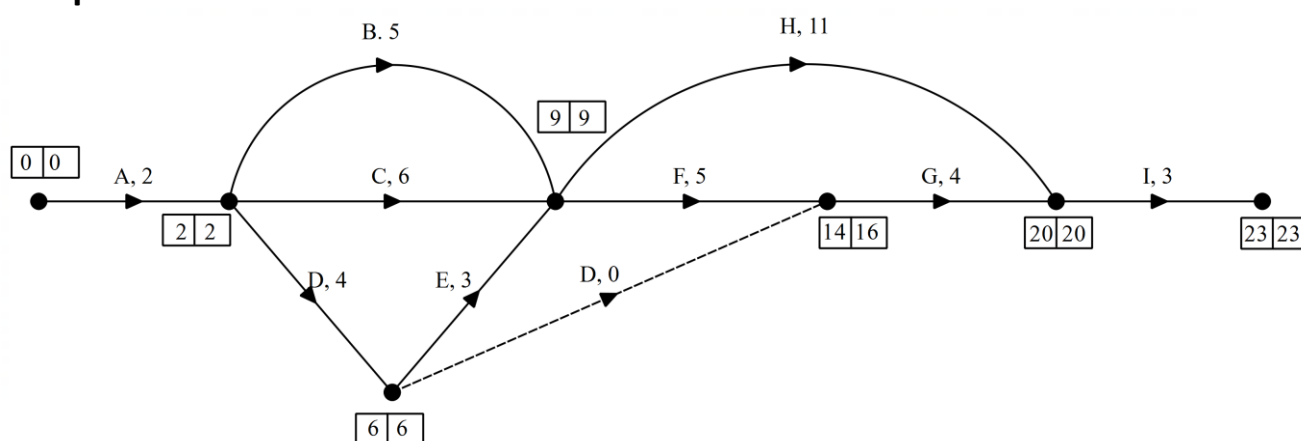
A clothing company hires a marketing team for a project to launch their new summer line. The activity chart below shows the different activities within the project and their estimated time in days.

Activity	Duration	Prerequisite
A	2	-
B	5	A
C	6	A
D	4	A
E	3	D
F	5	B, C, E
G	4	D, F
H	11	B, C, E
I	3	G, H

- (a) Construct a network diagram for the project above. Show the earliest start time and latest start time for each activity.

Criteria	Marks
• Calculates the latest start time for each activity accurately	3
• Calculates the earliest start time for each activity accurately	2
• Draws the network diagram accurately	1

Sample answer:



- (b) What is the minimum completion time for the project?

Criteria	Marks
Provides correct solution	1

Sample answer:

The minimum completion time is 23 days

- (c) Activity *C* can be reduced by 2 days at a cost of \$500 per day. If the company had the available funds, should they consider this additional cost in order to reduce the overall completion time? Justify your answer.

Criteria	Marks
Provides correct solution	1

Sample answer:

No, the company should not consider this additional cost as Activity *C* is not an activity on the critical path. As a result, reducing the time taken to complete this activity will not have an effect on the overall project completion time.

Question 30 (2 marks)

Amanda wants to save \$30 000 to use as spending money when she travels overseas in 3 years' time.

If she invests \$5000 at the end of every 6 months into an account earning 6% p.a., compounded half-yearly, will she have enough?

Use the table below to justify your answer.

Periods (n)	Future value of an Annuity of \$1				
	Interest Rate				
	2%	3%	4%	5%	6%
2	2.020	2.030	2.040	2.050	2.060
4	4.122	4.184	4.247	4.310	4.375
6	6.308	6.468	6.633	6.802	6.975
8	8.583	8.892	9.214	9.549	9.898
10	10.950	11.464	12.006	12.578	13.181

Criteria	Marks
• Provides correct statement	2
• Makes some progress towards the solution	1

Sample answer:

$$\begin{aligned}\text{Final Value} &= 5000 \times 6.468 \\ &= \$32\,340\end{aligned}$$

$$\$32\,340 > \$30\,000$$

$$\begin{aligned}\text{Difference} &= 32\,340 - 30\,000 \\ &= 2340\end{aligned}$$

$\therefore$ Amanda will have an excess of \$2340

Question 31 (4 marks)

Chris is buying a used car which has a sale price of \$23 950. In addition to the sale price there are the following costs:

Transfer of registration	\$34
Stamp duty	

- (a) Stamp Duty for this car is calculated at \$3 for every \$100, or part thereof, of the sale price.

Calculate the Stamp Duty payable.

Criteria	Marks
• Provides correct solution	1

Sample answer:

$$\begin{aligned}\text{Stamp Duty} &= 3 \times \frac{24\,000}{100} \\ &= \$720\end{aligned}$$

- (b) Chris wishes to take out comprehensive insurance for the car for 12 months. The cost of comprehensive insurance is calculated using the following:

Base rate	\$1250
Fire Service Levy (FSL)	1% of base rate
Stamp Duty	5.5% of the total of base rate and FSL
GST	10% of the total of base rate and FSL

Find the total amount that Chris will need to pay for comprehensive insurance.

Criteria	Marks
• Provides correct solution	2
• Makes significant progress to correct solution	1

Sample answer:

Base Rate = \$1250

FSL = 0.01×1250

= \$12.50

Base Rate + FSL = \$1262.50

$\therefore$ Stamp Duty = 0.055×1262.50

= \$69.44

GST = 0.10×1262.50

= \$126.25

Total Payable = $1250 + 12.50 + 69.44 + 126.25$

= \$1458.19

- (c) Chris has decided he will take out comprehensive car insurance rather than the less expensive non-compulsory third-party car insurance.

What extra cover is provided by the comprehensive car insurance?

Criteria	Marks
• Provides correct statement	1

Sample answer:

Comprehensive car insurance provides cover to the 'at-fault' driver's vehicle, meaning the damage to Chris' car will be fixed as well, should he be 'at-fault'.

End of paper