

2026 HSC SIMULATED EXAMINATION

Mathematics Standard 2

**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 mins for this section

Section II – 70 marks

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

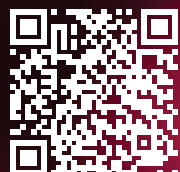


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- B Communication
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- B Education (Primary)
- B Education (Secondary)
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- B Arts (Interpreting and Translation)
- B Laws
- B Performing Arts (Acting)
- 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)
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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

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

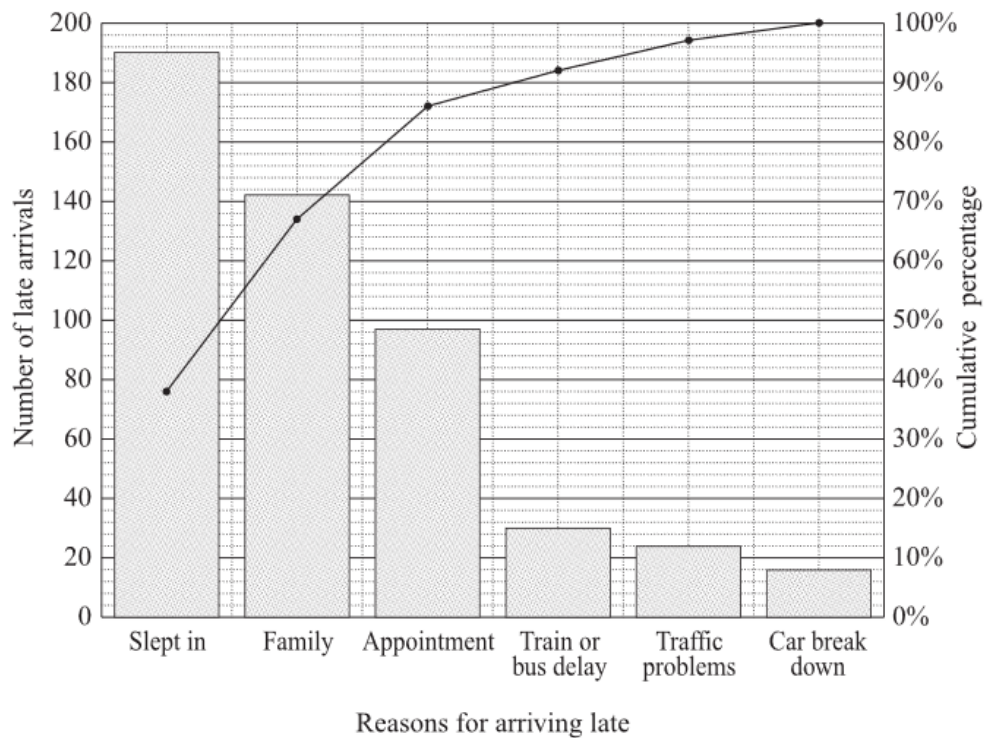
- (A) 2.56×10^4
- (B) 2.6×10^5
- (C) 2.56×10^6
- (D) 2.6×10^6

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

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
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.

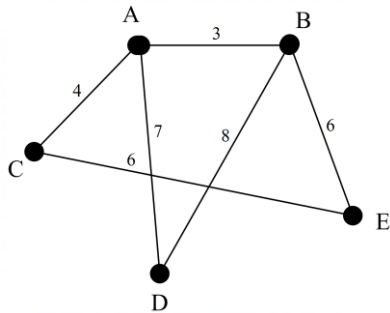
What is the probability that she misses the dartboard with both darts?

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

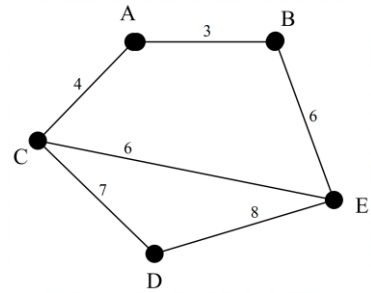
6. Which network diagram is represented by this table?

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

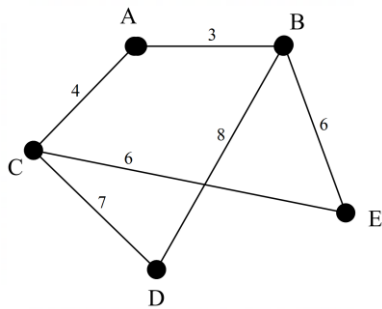
(A)



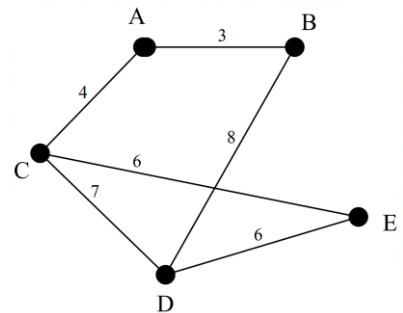
(B)



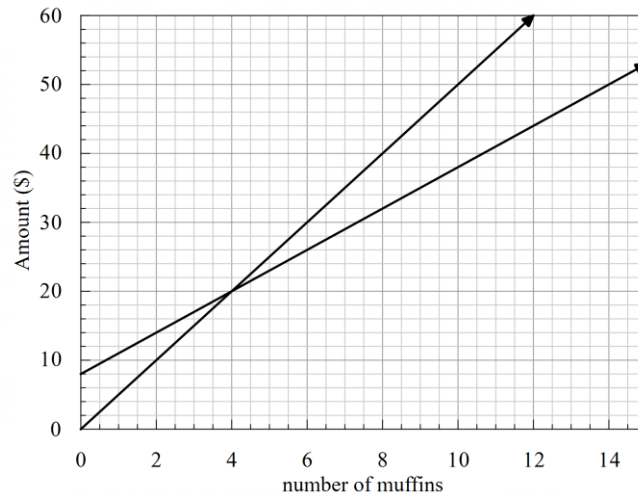
(C)



(D)

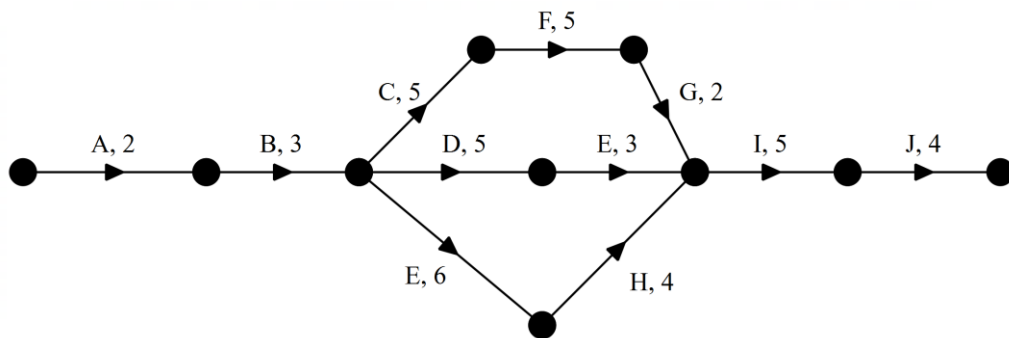


7. Dionne makes muffins to sell at the weekend markets. The diagram below shows the cost of making the muffins and the income she receives from their sales.



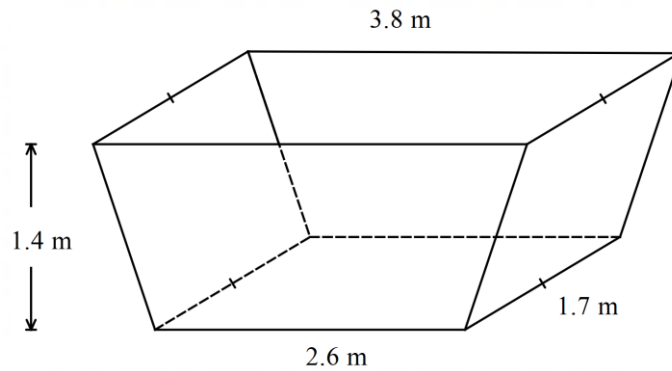
Which of the following statements is true?

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

End of Section I

2026**HSC SIMULATED EXAMINATION**

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. **3**

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

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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. **1**

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(b) Between what lower and upper limits does the actual area of the top of the chopping board lie? **2**

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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. **2**

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

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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. **2**

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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.2

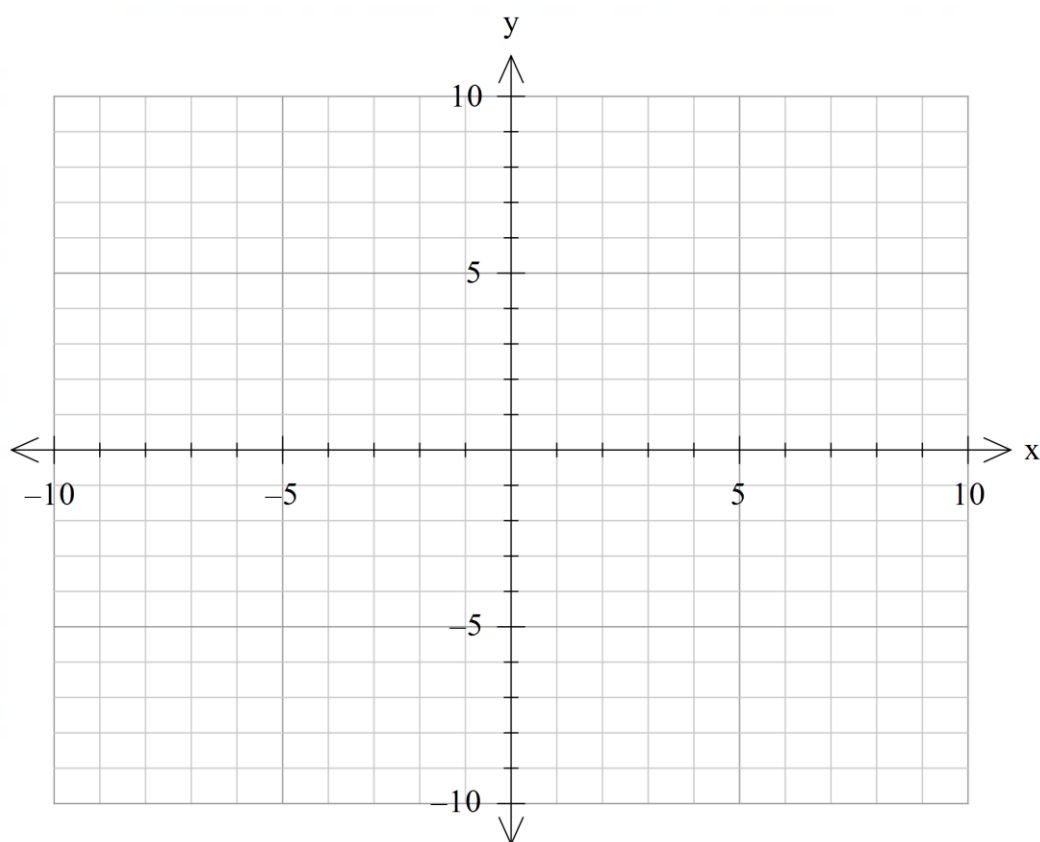
- (b) What is the minimum travel time between station A and station D?1

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.

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



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Question 17 (4 marks)

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

4

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

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.

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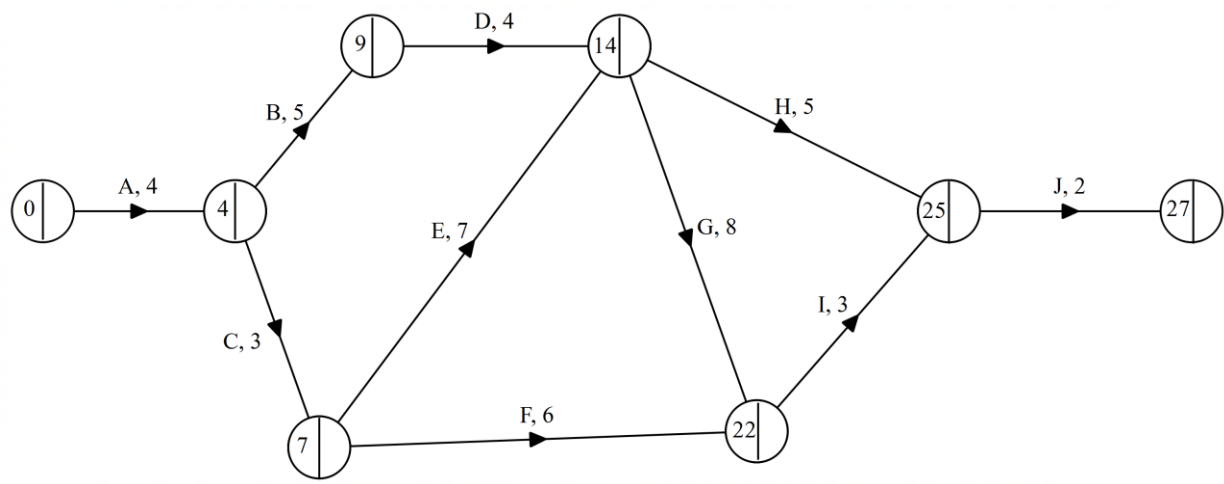
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Question 18 (3 marks)

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. 1

(b) What is the float time on Activity *D*? 1

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(c) Identify the activities that are on the critical path. 1

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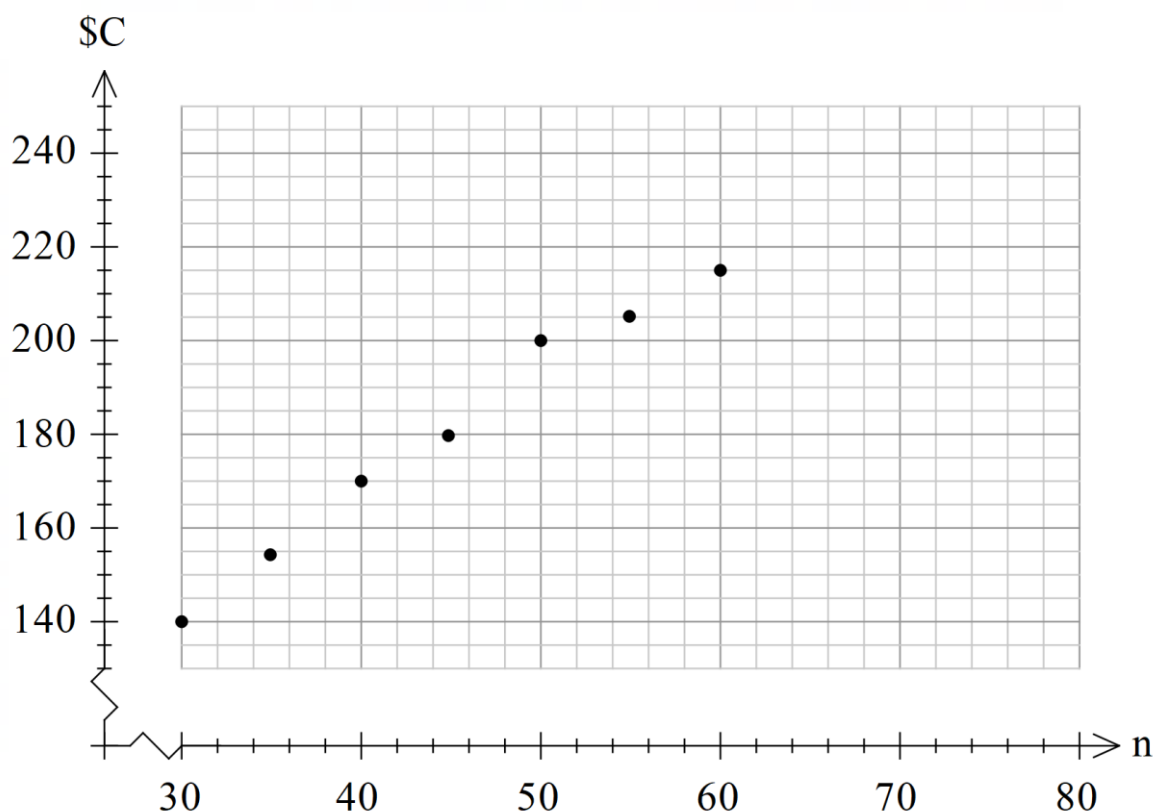
Question 19 (5 marks)

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.

1



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

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Question 19 continues on the next page

Question 19 (continued)

- (c) Calculate Pearson's correlation coefficient, correct to 2 significant figures. 1

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- (d) Describe the direction and strength of the association between the number of meals prepared and the costs. 1

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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. 2

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.

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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.

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

2

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

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

2

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.

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Question 22 (3 marks)

Steve purchased 500 company shares at \$3.70 per share. Brokerage fees were 1.5% of the purchase price. **3**

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?

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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? **2**

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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.

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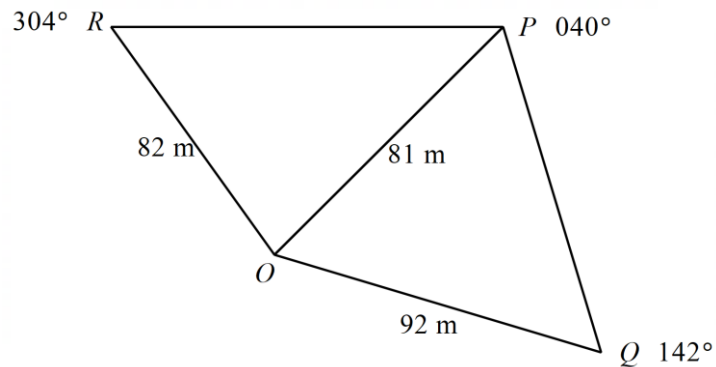
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Question 25 (3 marks)

A radial survey of a park is shown below.



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

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

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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. 2

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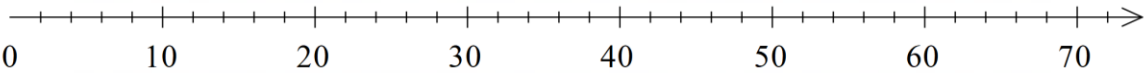
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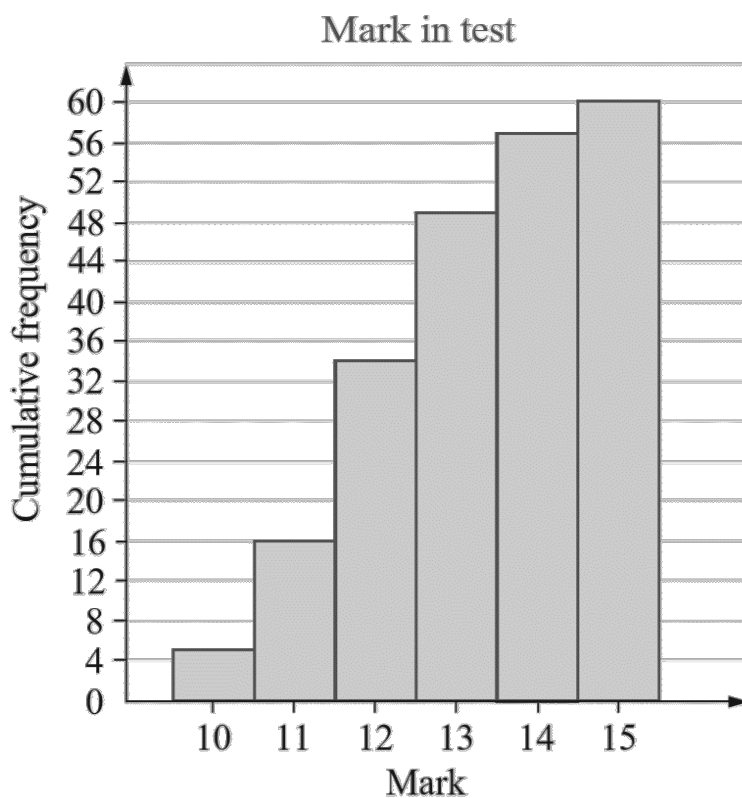
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(b) Draw a box-plot to represent this information. 2



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.

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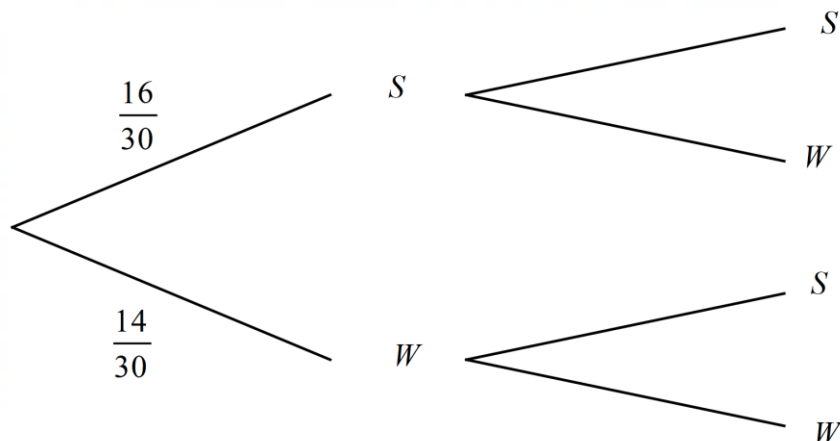
Question 28 (5 marks)

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.

2



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

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

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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.3

- (b) What is the minimum completion time for the project?1

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- (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.1

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Question 30 (2 marks)

Amanda wants to save \$30 000 to use as spending money when she travels overseas in 3 years' time. 2

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

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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. **1**

Calculate the Stamp Duty payable.

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- (b) Chris wishes to take out comprehensive insurance for the car for 12 months. The cost of comprehensive insurance is calculated using the following: **2**

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.

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- (c) Chris has decided he will take out comprehensive car insurance rather than the less expensive non-compulsory third-party car insurance. **1**

What extra cover is provided by the comprehensive car insurance?

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End of paper