Ascham School

NESA Number

2025 **TRIAL EXAMINATION**

Mathematics Standard 2

General Instructions

- Reading time – 10 minutes
- Working time – 2 hours and 30 minutes
- Write using black pen
- Calculators approved by NESA may be used
- A reference sheet is provided separately
- For questions in Section II, show relevant mathematical reasoning

Total Marks: 100

Section I – 15 marks

- Attempt Questions 1-15
- Allow about 25 minutes for this section

Section II – 85 marks (PART A, B + C)

- Attempt Questions 16-42
- Allow about 2 hours and 5 minutes for this section

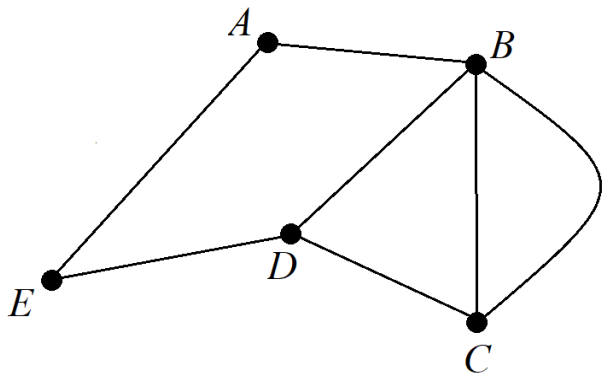
Section I

15 marks
Attempt Questions 1-15
Allow about 25 minutes for this section

Use the separate multiple-choice answer sheet for Questions 1-15.

---

1 Consider the network diagram



What is the sum of the degrees of all the vertices in this network?

A. 5

B. 7

C. 10

D. 14

2 A new mountain bike was purchased for $1386, including 10% GST.

What was the price of the bike before GST, correct to the nearest dollar?

A. $1240

B. $1260

C. $1305

D. $1525

3 Most cars use fuel that is a blend of 90% petrol and 10% ethanol.

What is the ratio of petrol to ethanol in this blend?

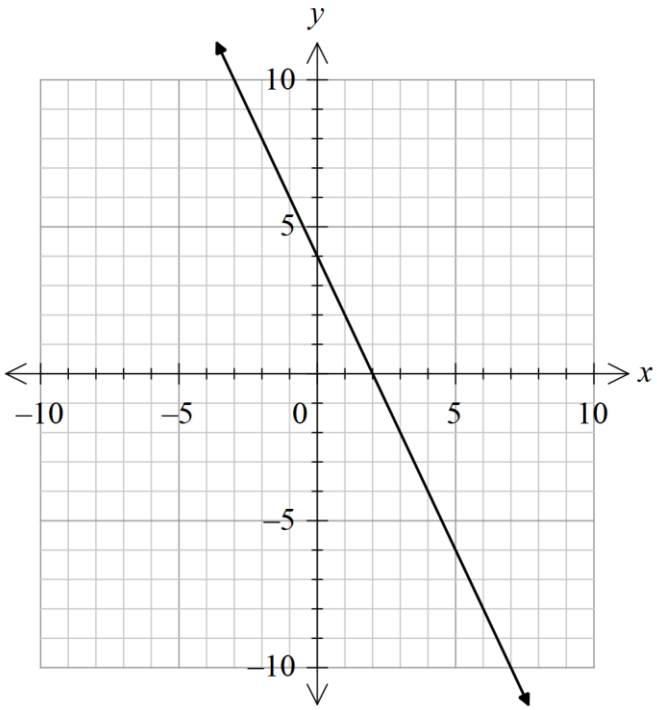
A. 9:1

B. 1:9

C. 10:1

D. 1:10

4 Consider the line below.



What is the equation of the line?

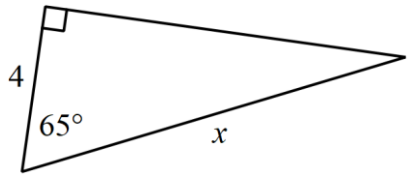
A. $y = 2x + 2$

B. $y = -2x + 2$

C. $y = 2x + 4$

D. $y = -2x + 4$

5 What is the correct expression for the value of x in this triangle?



A. $\dfrac{4}{\cos 65°}$

B. $\dfrac{4}{\sin 65°}$

C. $4\cos 65°$

D. $4\sin 65°$

6 Young's formula below is used to calculate the required dosages of medicine for children aged 1-12 years.

$$\text{Dosage} = \frac{\text{age of child (in years)} \times \text{adult dosage}}{\text{age of child (in years)} + 12}$$

Each Adult dosage is 45 mL. How much medicine should be given to an 18-month-old child in a 24-hour period if the child has a dose of medicine every 6 hours?

A. 5 mL

B. 20 mL

C. 27 mL

D. 30 mL

7 A table of future value interest factors for an annuity of $1 is shown.

Table of future value interest factors for an annuity of $1

Period	*Interest rate per period*				
	1%	*2%*	*3%*	*4%*	*5%*
1	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500
3	3.0301	3.0604	3.0909	3.1216	3.1525
4	4.0604	4.1216	4.1836	4.2465	4.3101

Peta made equal contributions of $2 500 into an account at the end of every 6 months for 2 years at an interest rate of 4% per annum.

What is the future value of this annuity?

A. $10 304.00

B. $10 616.25

C. $5 050.00

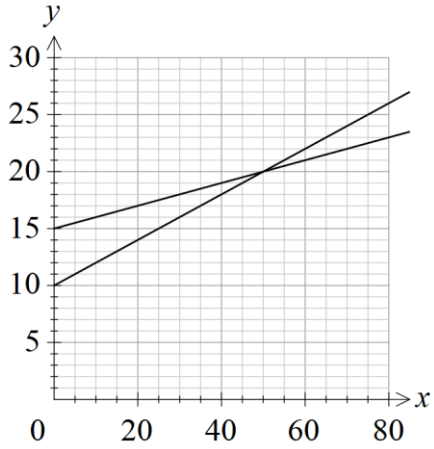
D. $5 100.00

8 The cost of two different mobile phone plans is given by the equations:

- Plan A: $y = 0.1x + 15$
- Plan B: $y = 0.2x + 10$

where y is the total monthly cost in dollars and x is the number of call minutes used.

These equations are graphed on the same axis below.



At what number of call minutes do both Plans cost the same?

A. 10

B. 15

C. 20

D. 50

9 A map has a scale of 1:20 000. Two towns are 12 km apart in real life.

How far apart are the two towns on the map, in centimetres?

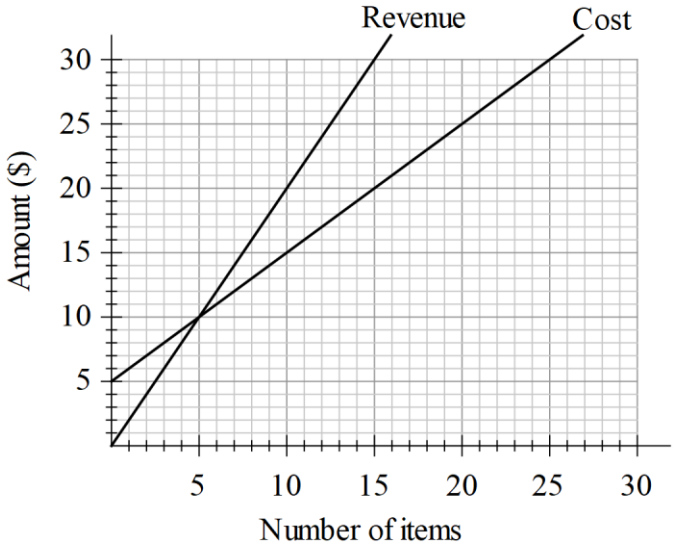
A. 6 cm

B. 24 cm

C. 60 cm

D. 240 cm

10 The daily production costs and revenue from the sale of a particular item is shown on the graph.



Which statement is **incorrect**?

A. If 5 items are sold, no profit is made.

B. If 10 items are sold a profit of $5 is made.

C. If 5 items are sold, a profit of $10 is made.

D. If 15 items are sold a profit of $10 is made.

11 A factory has a large juice tank that holds 16 kL of freshly squeezed orange juice.

If each bottle holds 750 mL, approximately how many bottles can be filled?

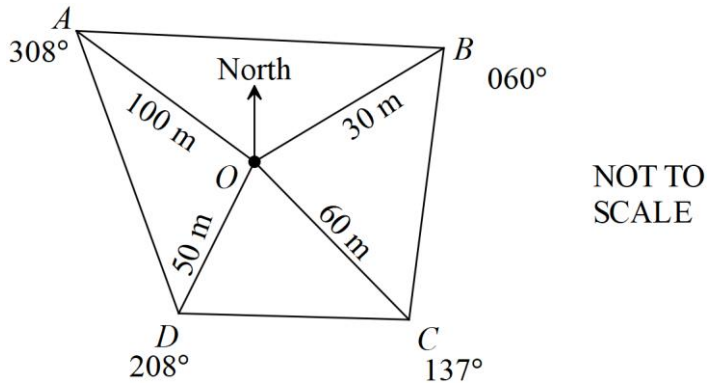
A. 21

B. 213

C. 2 133

D. 21 333

12 The diagram shows a radial survey of a field *ABCD*.



What is the distance between *A* and *B,* correct to the nearest metre?

A. 104 m

B. 115 m

C. 1391 m

D. 13148 m

13 A coin is biased so it shows heads to tails in the ratio of 2:3 when it is tossed. Find the number of heads expected if the coin is tossed 100 times.

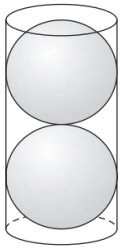
A. 20

B. 40

C. 50

D. 67

14 Two identical spheres fit exactly inside a cylindrical container, as shown.



The diameter of each sphere is 10 cm.

What is the volume of the cylindrical container, to the nearest cubic centimetre?

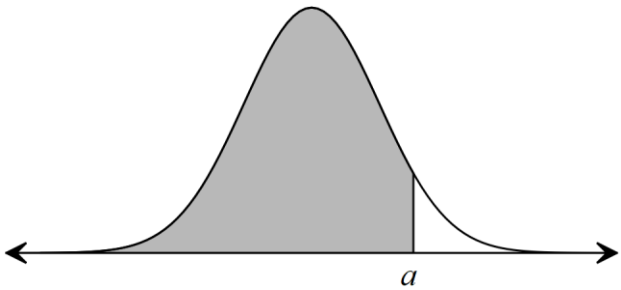
A. 785 cm^3

B. 1571 cm^3

C. 3142 cm^3

D. 6283 cm^3

15 A random variable is normally distributed with a mean of 0 and a standard deviation of 1. The probability that this random variable lies below *a,* for some positive value of *a* is represented by the shaded area below.



Which of the following statements is false?

A. $P(z < -a) = P(z > a)$

B. $P(z > -a) = 1 - P(z > a)$

C. $P(-a < z < a) = 2P(z < a) - 1$

D. $P(-a < z < a) = 1 - 2P(z < a)$

Question 16 (4 marks)

The arch of the Sydney Harbour Bridge spans 503 metres, correct to the nearest metre.

a) What is the precision of this measurement?

1

.....

b) What is the absolute error of this measurement?

1

.....

.....

.....

c) Calculate the percentage error for this measurement, correct to two decimal places.

2

.....

.....

.....

.....

.....

.....

Question 17 (2 marks)

The number of points per game scored by a basketball team in a season is normally distributed with a mean of 116 points per game and a standard deviation of 2.

What percentage of games will have between 112 and 118 points scored?

2

.....

.....

.....

.....

.....

.....

Do NOT write in this area.

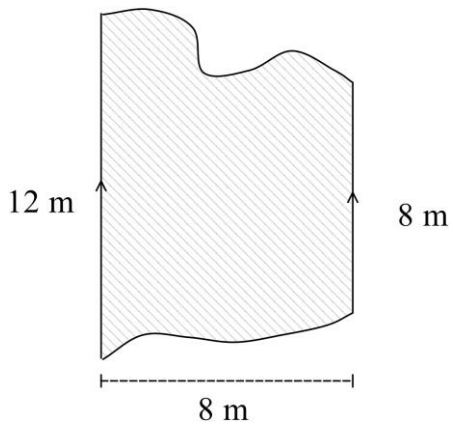
Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 18 (2 marks)

Solve $2x = \frac{x}{2} + 6$.

2

Question 19 (1 mark)



Use the trapezoidal rule to approximate the shaded area on the diagram above.

1

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 20 (1 mark)

Express 0.0009028 in standard form. Give your answer correct to three significant figures.

1

.....

.....

.....

.....

Question 21 (2 marks)

Mona's heart beats 72 times per minute. How many times will it beat in 24 hours?

2

.....

.....

.....

.....

.....

.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 22 (2 marks)

Make y the subject of the equation $a = \sqrt{by - 1}$.

2

Question 23 (2 marks)

Ray owns 1800 shares in a company. The total market price for the portfolio is \$27 000. Ray's dividend for each share is \$1.20.

Calculate the dividend yield for his shares.

2

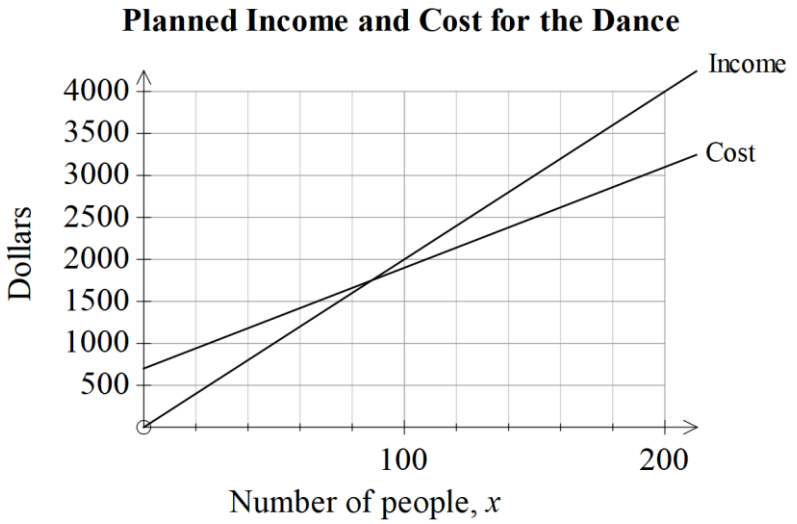
Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 24 (6 marks)

Jack and Judy are planning a fund-raising dance. They hire a hall for \$400 and a band for \$300. Refreshments will cost \$12 per person.

The graph shows planned income and cost with the ticket price set at \$20 per person.



a) Write a formula for the cost (\$$C$) of running the dance for x people.

1

.....

.....

.....

.....

b) Estimate the minimum number of people needed at the dance to cover the cost.

1

.....

.....

.....

c) How much profit will be made if 150 people attend the dance?

1

.....

.....

.....

.....

Question 24 continues on page 17

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 24 (continued)

d) Jack and Judy plan to sell 200 tickets. They want to make a profit of $1500. What should be the price of a ticket, assuming all 200 tickets will be sold?

3

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

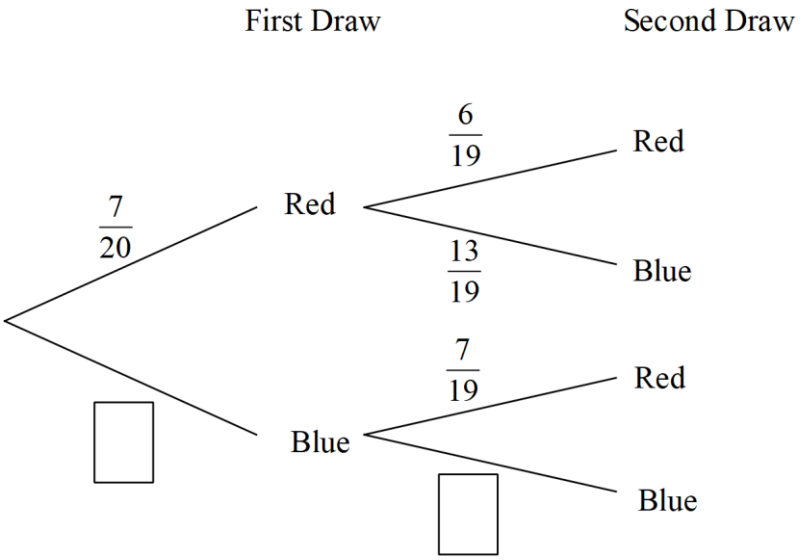
.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 25 (3 marks)

A bag contains 7 red balls and 13 blue balls. Two balls are selected at random without replacement. A partially completed tree diagram is shown below.



Complete the probability tree diagram and calculate the probability of selecting two balls of the same colour.

3

.....

.....

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 26 (3 marks)

The school librarian records the reasons students visited the help desk during Term 1. She displayed the results in the table below.

Reason	*Frequency*	*Cumulative frequency*	*Cumulative percentage*
Research Help	24	24	48
Wifi Issues	***A***	28	56
Find Book	12	40	80
Printing Issues	5	***B***	90
New Card	3	48	99
Forgotten Password	2	50	100
Total	50		

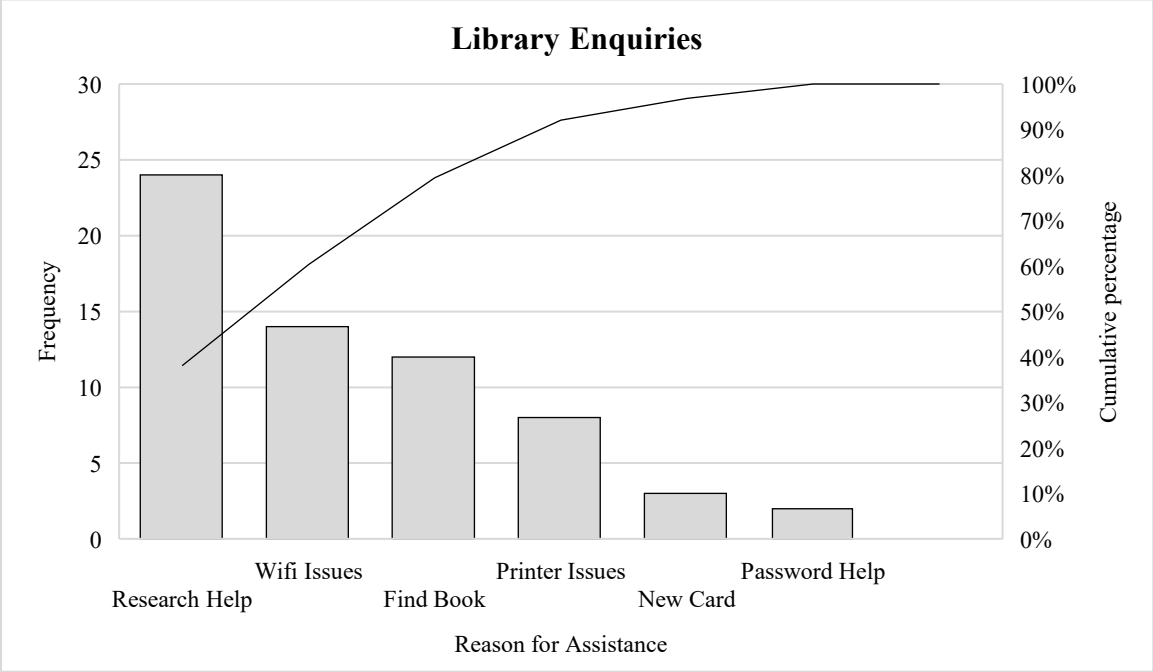
a) What are the values of ***A*** and ***B***?

2

. . . . . .

. . . . . .

b) The data from the table is shown in the following Pareto chart.



Explain ONE benefit of using a Pareto chart to display the data.

1

. . . . . .

. . . . . .

. . . . . .

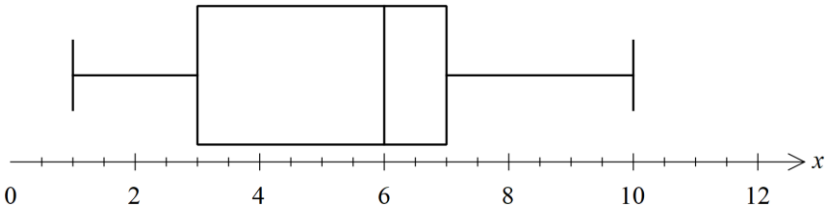
. . . . . .

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 27 (2 marks)

The box and whisker plot for a dataset is given.



Is 10 an outlier? Justify your answer with calculations.

2

.....

.....

.....

.....

.....

.....

Section II continues on PART B

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 28 (3 marks)

Charles's taxable income is $88 225.

The table below is used to calculate his tax payable. In addition, he pays the Medicare levy, which is 2% of his taxable income.

Taxable Income ($)	*Tax payable*
$0 – $18,200	Nil
$18 201 – $45 000	16c for each $1 over $18 200
$45 001 – $135 000	$4 288 plus 30c for each $1 over $45 000
$135 001 – $190 000	$31 288 plus 37c for each $1 over $135 000
$190 001 and over	$51 638 plus 45c for each $1 over $190 000

Calculate Charles's total tax payable.

3

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Do NOT write in this area.

Question 29 (5 marks)

The heights and weights of 8 preschoolers were measured and the results were recorded in the table below.

Heights and Weights of Pre-Schoolers

Height, h (cm)	102	100	105	98	104	99	103	101
Weight, w (kg)	16.5	15.2	17.8	14.6	17.2	15	16.1	15.6

a) Calculate the correlation coefficient, r. Give your answer correct to three significant figures.

1

.....

.....

.....

b) Comment on the strength of the correlation.

1

.....

.....

.....

c) Find the equation of the least squares regression line. Give the values in the equation correct to two decimal places.

2

.....

.....

.....

.....

.....

.....

d) Using your answer from part c), make a prediction for the weight of a preschooler who is 108 cm tall.

1

.....

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 30 (4 marks)

Robert is buying a new car which has a sale price of $22 850.

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.

1

.....

.....

.....

.....

b) The total purchase costs include a $79 registration fee, a $55 number plate fee, stamp duty and vehicle tax. Vehicle tax is calculated based on the tare weight of the vehicle. Given the car Robert purchased has a tare weight of 1250 kg and he will use the car for private use, calculate the total amount Robert pays.

Tare weight (kg)	*Private use fee*	*Business use fee*
Up to 975	$266	$429
976 to 1154	$308	$487
1155 to 1504	$374	$588
1505 to 2504	$570	$883
2505 to 2794	$822	$1,370

2

.....

.....

.....

.....

.....

.....

.....

c) Robert has decided he will take out comprehensive car insurance in addition to the compulsory third party insurance.

State ONE extra cover that is provided by the comprehensive car insurance.

1

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 31 (4 marks)

Jo has signed up for a premium gym membership that includes personal training and nutrition coaching. The upfront cost is $3600, but the gym offers a payment plan that allows members to pay in equal quarterly instalments over 2 years, with an annual interest rate of 8% p.a. compounded quarterly.

Table of present value interest factors for an annuity of $1

N \ r	*Interest rate per period as a percentage*						
	1%	2%	3%	4%	5%	6%	8%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9259
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.7833
3	2.9410	2.8839	2.8286	2.7751	2.7233	2.6730	2.5771
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3121
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	3.9927
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.6229
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.2064
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.7466

a) Find the value of each quarterly instalment Jo needs to make.

2

.....

.....

.....

.....

.....

.....

.....

b) Find the total amount he will repay over the 2 years.

1

.....

.....

.....

.....

c) Find the total interest paid over the life of the payment plan.

1

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 32 (4 marks)

Sue lives in New York $(40° \text{ N}, 74° \text{ W})$. She plans to travel to Copenhagen which is $15°$ North of New York and $86°$ East of New York.

a) What is the latitude and longitude of Copenhagen?

2

.....

.....

.....

.....

b) Copenhagen is 2 hours ahead of Coordinated Universal Time (UTC +2) and New York is 5 hours behind Coordinated Universal Time (UTC -5).

Sue travels from New York to Copenhagen. Her plane leaves New York at 6:00 pm on Friday local time and flies non-stop to Copenhagen.

The flight takes 9 hours and 50 minutes.

What time and day is it in Copenhagen when the plane lands?

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

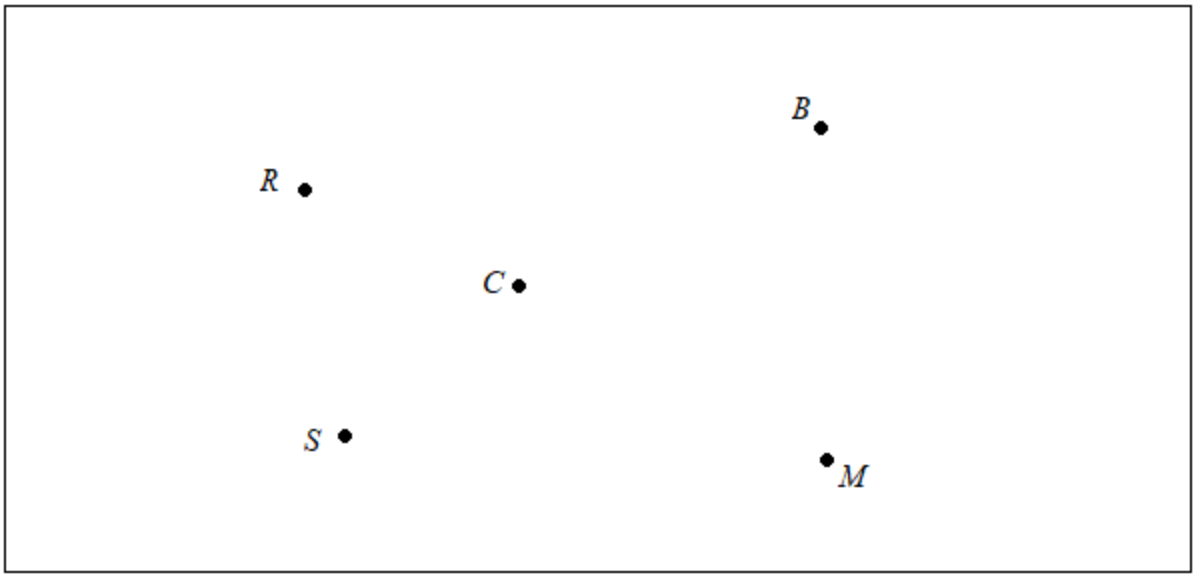
Question 33 (4 marks)

A logistics company manages deliveries between a group of towns. Each directed arrow in the network represents a one-way road used for deliveries. The company uses this network to plan the most efficient delivery paths and avoid unnecessary travel and traffic. The table below shows the distances, in kilometres, between several towns.

From:	*To:*	*Distance (km)*
Mapleton, *M*	Brookvale, *B*	8
Mapleton, *M*	Clearwater, *C*	20
Brookvale, *B*	Clearwater, *C*	10
Brookvale, *B*	Riverton, *R*	15
Clearwater, *C*	Riverton, *R*	8
Clearwater, *C*	Stonebridge, *S*	25
Riverton, *R*	Stonebridge, *S*	16

a) Using the vertices given, draw a weighted directed network diagram to represent the information shown in the table.

2



b) A delivery needs to be made from Mapleton to Stonebridge and charges $2.30 per km travelled. What is the lowest price the company could charge for this delivery?

2

.....

.....

.....

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 34 (3 marks)

CodeNest, a technology company tracks the daily step counts of its staff as part of a workplace wellness initiative.
The average daily step count is 8 000 steps, with a standard deviation of 1 200 steps.

On a particular day, Oliver recorded 5 600 steps.

a) Calculate Oliver's z-score.

1

.....

.....

.....

.....

.....

.....

.....

b) CodeNest has a total of 280 employees. Assuming the step counts are normally distributed, approximately how many employees recorded a higher step count than Oliver on that day?

2

.....

.....

.....

.....

.....

.....

.....

.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 35 (2 marks)

Claudia has a credit card which has an interest rate of 16% per annum. The interest is compounded daily and is charged on the amount owing with no interest free period. The period for which interest is charged includes the date of purchase and the date of payment.

On 10th March, Claudia purchased tickets for \$620 using her credit card. No other purchases were made using this card for the remainder of the month.

What amount was paid when the account was paid in full on 5th April?

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Section II continues on PART C

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 36 (2 marks)

A random variable is normally distributed with mean 0 and standard deviation 1. The table below gives the probability that this random variable lies below z for different values of z.

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	0.500	0.540	0.579	0.618	0.655	0.691	0.726	0.758	0.788	0.816
1	0.841	0.864	0.885	0.903	0.919	0.933	0.945	0.955	0.964	0.971

A manufacturer produces luxury scented candles. The mass of wax in each candle is normally distributed with a mean of 300 grams and a standard deviation of 4 grams.

What percentage of candles would you expect to contain more than 302 grams of wax?

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 37 (3 marks)

An outdoor adventurer uses a pedal-powered generator to recharge the battery of her satellite communication device while camping off-grid.
While pedalling she burns energy at a rate of 720 kilocalories per hour. The generator converts this energy and stores it as electricity in the device's battery.

Her satellite device requires 1.8 kWh of electricity per day. How long must she pedal each day to generate enough energy to power the device?

Give your answer in hours and minutes, correct to the nearest minute.
Note: 1 kcal = 4.184 kj and 3600 kj = 1 kWh

3

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

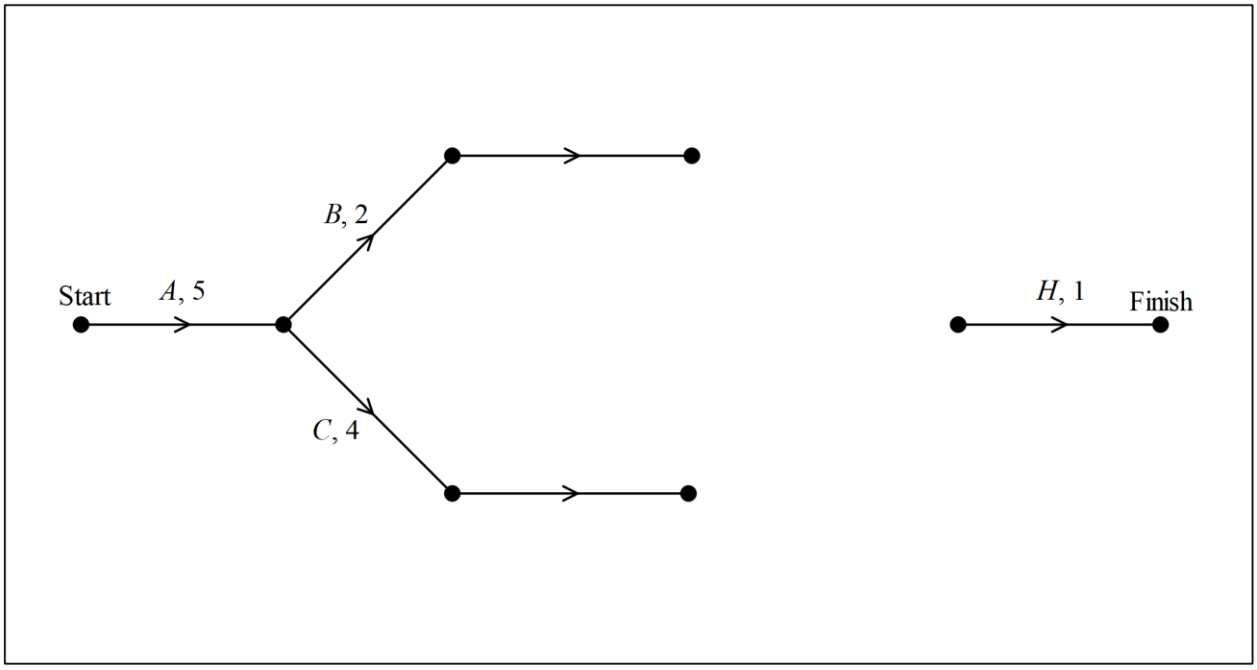
Question 38 (6 marks)

The drama department at a school is planning a school musical production. The following table outlines the key activities, their durations and which activities must be completed before others can begin.

Activity	Description	Duration (weeks)	Predecessor(s)
A	Write script	5	—
B	Audition cast	2	*A*
C	Design set and costumes	4	*A*
D	Cast rehearsals	6	*B*
E	Build set and create costumes	3	*C*
F	Rehearse with full staging	4	*D, E*
G	Technical setup (lighting/sound)	1	*E*
H	Final dress rehearsal	1	*F, G*

a) Complete the network diagram for the school musical production.

2



b) Identify the critical path and determine the minimum time needed to complete the project.

2

.....

.....

.....

.....

Question 38 continues on page 5

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 38 (continued)

c) What is the float time for Activity *E*?

1

.....

.....

d) Activity *C* is delayed by 3 weeks causing a delay to the entire production. By how many weeks is the overall production delayed?

1

.....

.....

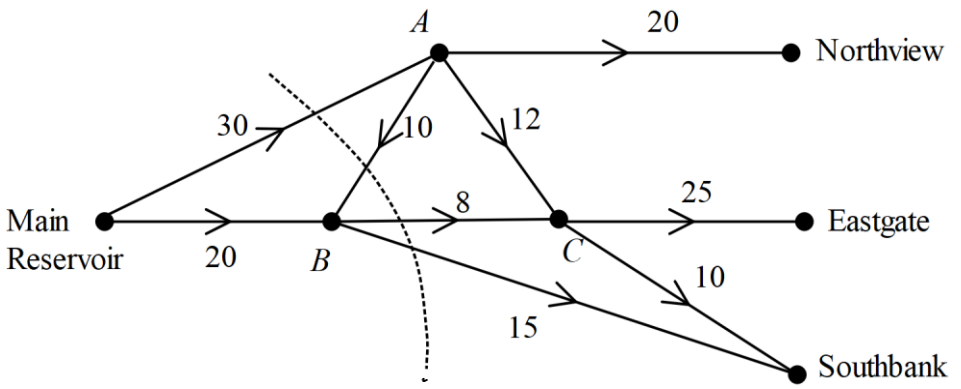
Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 39 (4 marks)

HydroCity is a city that relies on a network of water pipes to supply clean water from its main reservoir to three different suburbs: Northview, Eastgate, and Southbank. The system is represented by a flow network where each pipe has a maximum capacity in kilolitres per hour.

The diagram below shows the layout of the water distribution system. Each edge is labelled with the maximum flow capacity of that pipe.



a) Calculate the capacity of the cut drawn on the network above.

1

.....

.....

.....

.....

b) Determine the maximum flow of the network.

1

.....

.....

.....

.....

c) Pipe *BC* is due for repairs and will undergo a renovation that will increase its capacity. Will the increase in capacity in Pipe *BC* change the maximum flow of the network? Justify your answer with mathematical reasoning or calculation.

2

.....

.....

.....

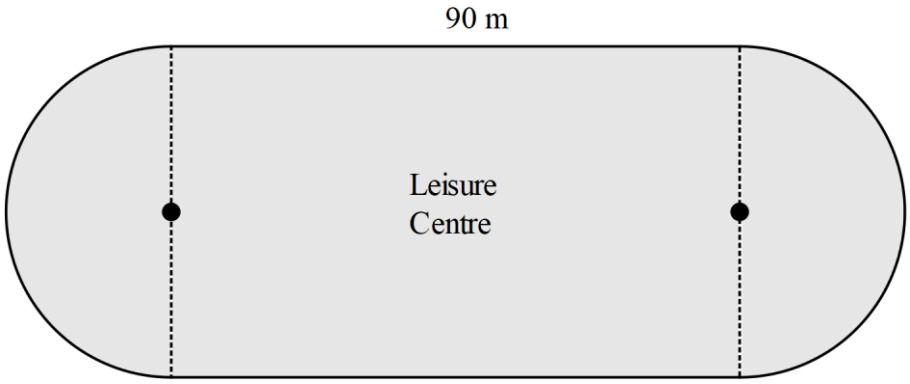
.....

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 40 (4 marks)

A new leisure centre is designed with a running track on its perimeter. The track follows the entire outer edge of the shape below, which comprises of a rectangle and two semi-circles.



a) The length of the running track is 400 m. Find the length of the diameter of the semicircles, give your answer correct to the nearest whole metre.

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

b) It takes Piper 2 minutes to run around the track. What was Piper's average speed in kilometres per hour?

2

.....

.....

.....

.....

.....

.....

.....

.....

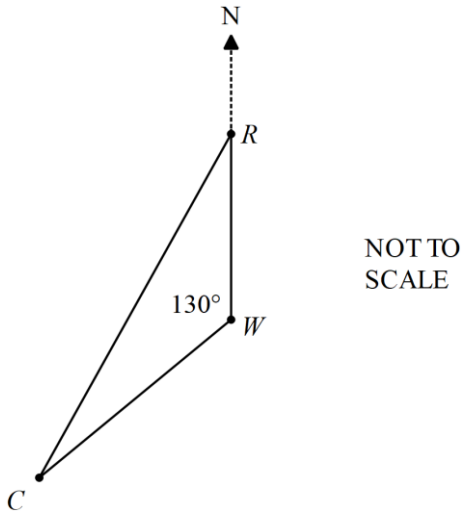
.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 41 (4 marks)

The diagram below shows the location of three landmarks in a national park: a Ranger Station R, a Waterfall W, and a Campsite C. The Ranger Station R is due north of the Waterfall W and $\angle RWC$ is $130°$.



Isla and Gabriel decide to go on solo hikes from the Waterfall. They both leave at 2 pm. Following a direct route, Isla arrives at the Ranger Station at 3 pm. She travels at a speed of 5 km/h. Gabriel travels directly to the Campsite and arrives at 4 pm. Gabriel travels at a speed of 7 km/h.

a) Show that the shortest distance between Isla and Gabriel when they have reached their destinations is 18 km. Give your answer to the nearest kilometre.

2

.....

.....

.....

.....

.....

.....

.....

Question 41 continues on page 9

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 41 (continued)

b) By letting $RC = 18$ km, as shown in part a), determine the bearing of the Ranger Station from the Campsite. Give your answer correct to the nearest degree.

2

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

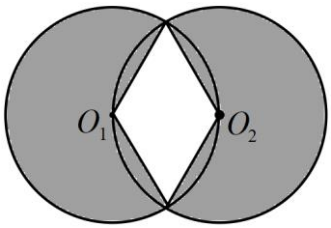
.....

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 42 (3 marks)

Jenna is designing a logo for a school project using circles with a diamond feature in the middle.



The centre of each circle lies on the circumference of the other.
Both circles have the same radius of 4 centimetres.

Jenna needs to calculate the shaded area to work out how much glitter to buy for her project.
Find the shaded area, give your answer correct to two decimal places.

3

End of paper

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

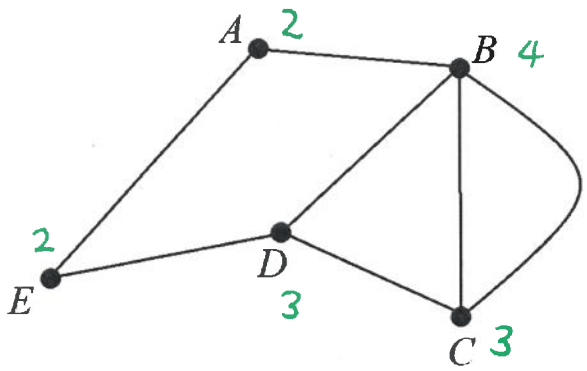
Section I

15 marks
Attempt Questions 1-15
Allow about 25 minutes for this section

Use the separate multiple-choice answer sheet for Questions 1-15.

---

1 Consider the network diagram



What is the sum of the degrees of all the vertices in this network?

A. 5

B. 7

C. 10

D. 14

2 A new mountain bike was purchased for $1386, including 10% GST.

What was the price of the bike before GST, correct to the nearest dollar?

A. $1240

B. $1260

$1386 \div 1.1 = 1260$

C. $1305

D. $1525

3 Most cars use fuel that is a blend of 90% petrol and 10% ethanol.

What is the ratio of petrol to ethanol in this blend?

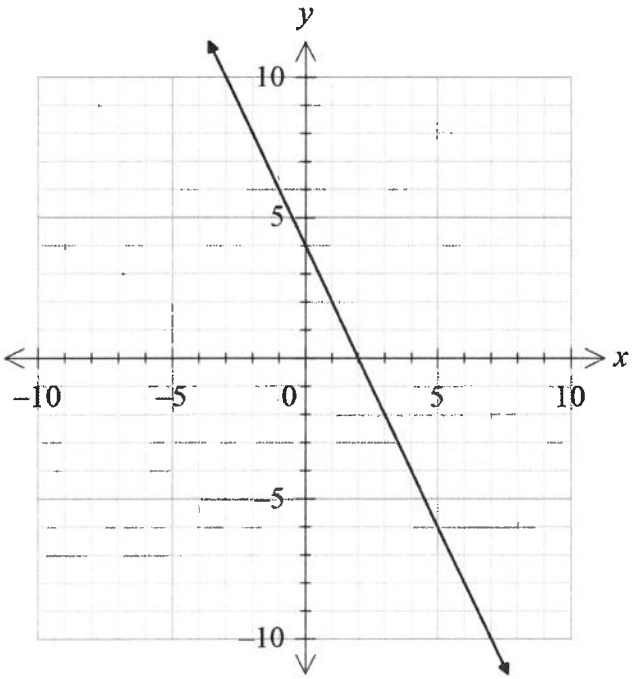
A. 9:1

B. 1:9

C. 10:1

D. 1:10

4 Consider the line below.



What is the equation of the line?

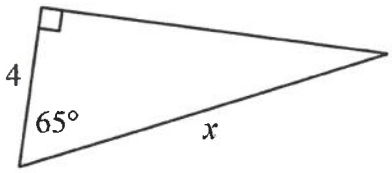
A. $y = 2x + 2$

B. $y = -2x + 2$

C. $y = 2x + 4$

D. $y = -2x + 4$

5 What is the correct expression for the value of x in this triangle?



A. $\dfrac{4}{\cos 65°}$

B. $\dfrac{4}{\sin 65°}$

C. $4\cos 65°$

D. $4\sin 65°$

$\cos 65 = \dfrac{4}{x}$

$x = \dfrac{4}{\cos 65}$.

6 Young's formula below is used to calculate the required dosages of medicine for children aged 1-12 years.

$$\text{Dosage} = \frac{\text{age of child (in years)} \times \text{adult dosage}}{\text{age of child (in years)} + 12}$$

Each Adult dosage is 45 mL. How much medicine should be given to an 18-month-old child in a 24-hour period if the child has a dose of medicine every 6 hours?

A. 5 mL

B. 20 mL

C. 27 mL

D. 30 mL

$\dfrac{1.5 \times 45}{1.5 + 12} = 5$

$4 \times 5 = 20$

7 A table of future value interest factors for an annuity of $1 is shown.

Table of future value interest factors for an annuity of $1

Period	*Interest rate per period*				
	1%	*2%*	*3%*	*4%*	*5%*
1	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500
3	3.0301	3.0604	3.0909	3.1216	3.1525
4	4.0604	4.1216	4.1836	4.2465	4.3101

Peta made equal contributions of $2 500 into an account at the end of every 6 months for 2 years at an interest rate of 4% per annum.

What is the future value of this annuity?

A. $10 304.00

B. $10 616.25

C. $5 050.00

D. $5 100.00

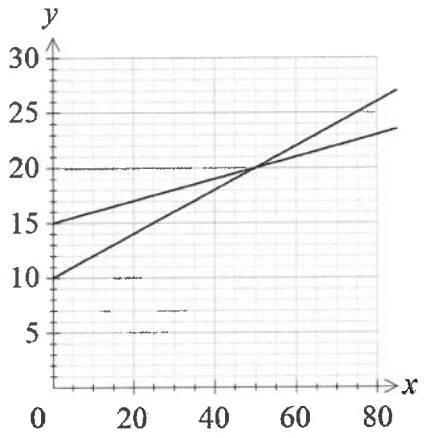
FV = 2500 X 4.1216

8 The cost of two different mobile phone plans is given by the equations:

- Plan A: $y = 0.1x + 15$
- Plan B: $y = 0.2x + 10$

where y is the total monthly cost in dollars and x is the number of call minutes used.

These equations are graphed on the same axis below.



At what number of call minutes do both Plans cost the same?

A. 10

B. 15

C. 20

D. 50

9 A map has a scale of 1:20 000. Two towns are 12 km apart in real life.

How far apart are the two towns on the map, in centimetres?

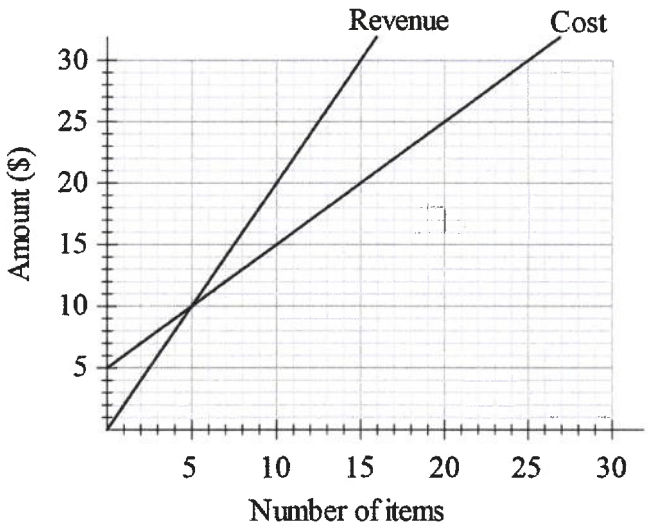
A. 6 cm

B. 24 cm

C. 60 cm

D. 240 cm

10 The daily production costs and revenue from the sale of a particular item is shown on the graph.



Which statement is **incorrect**?

A. If 5 items are sold, no profit is made.

B. If 10 items are sold a profit of $5 is made.

C. If 5 items are sold, a profit of $10 is made.

D. If 15 items are sold a profit of $10 is made.

11 A factory has a large juice tank that holds 16 kL of freshly squeezed orange juice.

If each bottle holds 750 mL, approximately how many bottles can be filled?

A. 21

B. 213

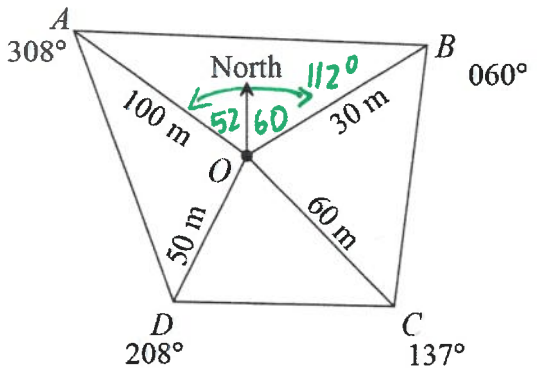
C. 2 133

D. 21 333

$\frac{16\text{kL}}{750\text{mL}} = \frac{16\,000\text{L}}{0.75\text{L}}$

$= 21333.\dot{3}$

12 The diagram shows a radial survey of a field *ABCD*.



NOT TO SCALE

What is the distance between *A* and *B*, correct to the nearest metre?

A. 104 m

B. 115 m

C. 1391 m

D. 13148 m

$AB^2 = 100^2 + 30^2 - 2(100)(30)\cos 112$

$= 13147.63..$

$AB = 114.66..$

13 A coin is biased so it shows heads to tails in the ratio of 2:3 when it is tossed. Find the number of heads expected if the coin is tossed 100 times.

A. 20

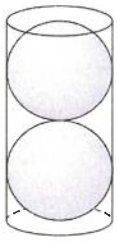
B. 40

C. 50

D. 67

$\frac{2}{5} \times 100 = 40$

14 Two identical spheres fit exactly inside a cylindrical container, as shown.



The diameter of each sphere is 10 cm.

What is the volume of the cylindrical container, to the nearest cubic centimetre?

A. 785 cm^3

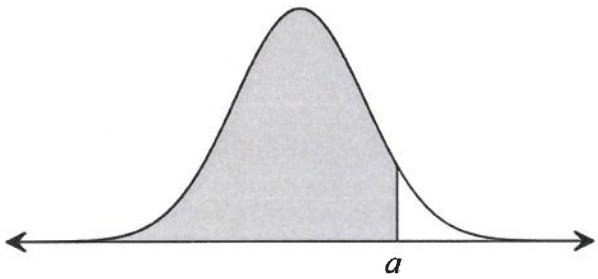
B. 1571 cm^3

C. 3142 cm^3

D. 6283 cm^3

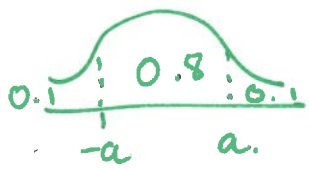
$V = \pi r^2 h$
$= \pi (5)^2 (20).$

15 A random variable is normally distributed with a mean of 0 and a standard deviation of 1. The probability that this random variable lies below a, for some positive value of a is represented by the shaded area below.



Which of the following statements is false?

let $P(z<-a) = 0.1$ $P(z>a)=0.9$
$P(z>a) = 0.1$
then $P(z<a) = 0.9$



$P(-a<z<a) = 0.8$

A. $\overset{0.1}{P(z<-a)} = \overset{0.1}{P(z>a)}$

B. $\overset{0.9}{P(z>-a)} = \overset{1-0.1=0.9}{1-P(z>a)}$

C. $\overset{0.8}{P(-a<z<a)} = \overset{2(0.9)-1=0.8}{2P(z<a)-1}$

D. $\overset{0.8}{P(-a<z<a)} = \overset{1-2(0.9)}{1-2P(z<a)} = -0.8$.

$0.8 \neq -0.8$
$\therefore$ false

Ascham School

S	O	L	U	T	I	O	N	S.	

NESA Number

Teacher: AF SW GS

2025 **TRIAL EXAMINATION**

Section I – Multiple Choice Answer Sheet

Mathematics Standard 2

1	A ○	B ○	C ○	D ●
2	A ○	B ●	C ○	D ○
3	A ●	B ○	C ○	D ○
4	A ○	B ○	C ○	D ●
5	A ●	B ○	C ○	D ○
6	A ○	B ●	C ○	D ○
7	A ●	B ○	C ○	D ○
8	A ○	B ○	C ○	D ●
9	A ○	B ○	C ●	D ○
10	A ○	B ○	C ●	D ○
11	A ○	B ○	C ○	D ●
12	A ○	B ●	C ○	D ○
13	A ○	B ●	C ○	D ○
14	A ○	B ●	C ○	D ○
15	A ○	B ○	C ○	D ●

Ascham School

2025 **TRIAL EXAMINATION**

Mathematics Standard 2
Section II Answer Booklet – **PART A**

30 marks
Attempt Questions 16-27
Allow about 40 minutes for this section

Instructions

- Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.
- Your responses should include relevant mathematical reasoning and/or calculations.
- Extra writing space is provided at the back of this booklet. If you use this space, clearly indicate which question you are answering.

Please turn over

Question 16 (4 marks)

The arch of the Sydney Harbour Bridge spans 503 metres, correct to the nearest metre.

a) What is the precision of this measurement? **1**

1m

b) What is the absolute error of this measurement? **1**

0.5m

c) Calculate the percentage error for this measurement, correct to two decimal places. **2**

$\% \text{ error} = \frac{0.5}{503} \times 100\%$

$= 0.0994\%$

$= 0.10\%$ (2dp)

Do NOT write in this area.

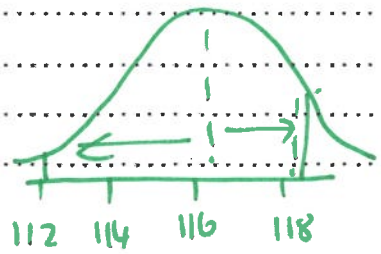
Question 17 (2 marks)

The number of points per game scored by a basketball team in a season is normally distributed with a mean of 116 points per game and a standard deviation of 2.

What percentage of games will have between 112 and 118 points scored? **2**

percentage $= \frac{1}{2} \times 95\% + \frac{1}{2} \times 68\%$

$= 81.5\%$



Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 18 (2 marks)

Solve $2x = \frac{x}{2} + 6$.

2

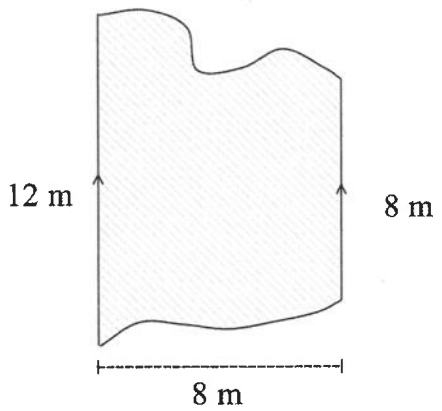
$2x = \frac{x}{2} + 6$

$4x = x + 12$

$3x = 12$

$x = 4$

Question 19 (1 mark)



Use the trapezoidal rule to approximate the shaded area on the diagram above.

1

$A \approx \frac{h}{2}(d_f + d_l)$

$\approx \frac{8}{2}(12 + 8)$

$\approx 80\,m^2$

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 20 (1 mark)

Express 0.0009028 in standard form. Give your answer correct to three significant figures.

1

$0.0009028 = 9.028 \times 10^{-4}$

$= 9.03 \times 10^{-4}$ (3sf)

Question 21 (2 marks)

Mona's heart beats 72 times per minute. How many times will it beat in 24 hours?

2

No. of beats $= 72 \times 60 \times 24$

$= 103\ 680$

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 22 (2 marks)

Make y the subject of the equation $a = \sqrt{by - 1}$.

2

$a = \sqrt{by - 1}$

$a^2 = by - 1$

$by = a^2 + 1$

$y = \frac{a^2 + 1}{b}$

Question 23 (2 marks)

Ray owns 1800 shares in a company. The total market price for the portfolio is \$27 000. Ray's dividend for each share is \$1.20.

Calculate the dividend yield for his shares.

2

Share price $= \frac{27\,000}{1800}$

$= \$15$

Div Yield $= \frac{1.20}{15}$

$= 0.08$

$= 8\%$

Ascham School Use Only – Do NOT write anything, or make any marks below this line

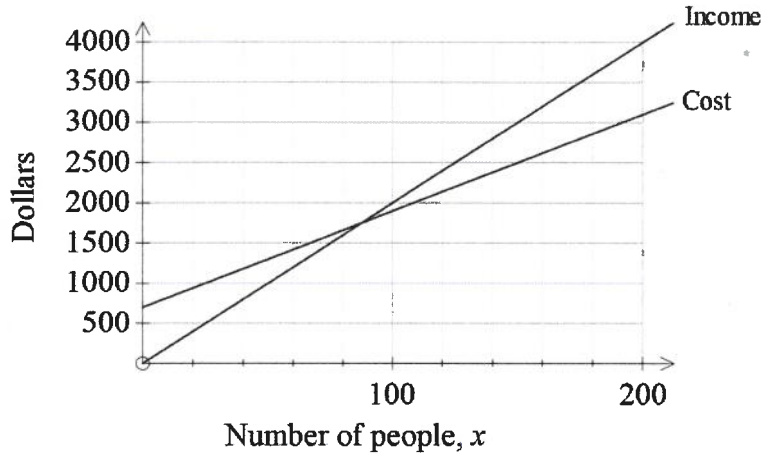
Do NOT write in this area.

Question 24 (6 marks)

Jack and Judy are planning a fund-raising dance. They hire a hall for \$400 and a band for \$300. Refreshments will cost \$12 per person.

The graph shows planned income and cost with the ticket price set at \$20 per person.

Planned Income and Cost for the Dance



a) Write a formula for the cost (\$$C$) of running the dance for x people. **1**

$C = 12x + 700$

b) Estimate the minimum number of people needed at the dance to cover the cost. **1**

Min Needed ≈ 90 people.

c) How much profit will be made if 150 people attend the dance? **1**

Cost = \$2500 Profit = 3000 − 2500

Income = \$3000 = \$500

Question 24 continues on page 17

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 24 (continued)

d) Jack and Judy plan to sell 200 tickets. They want to make a profit of $1500. What should be the price of a ticket, assuming all 200 tickets will be sold?

3

when $x = 200$, $C = 12(200) + 700$, $P = 1500$

$= 3100$

let p be the price, $I = 200p$.

$P = I - C$

$1500 = 200p - 3100$

$200p = 4600$

$p = 23$

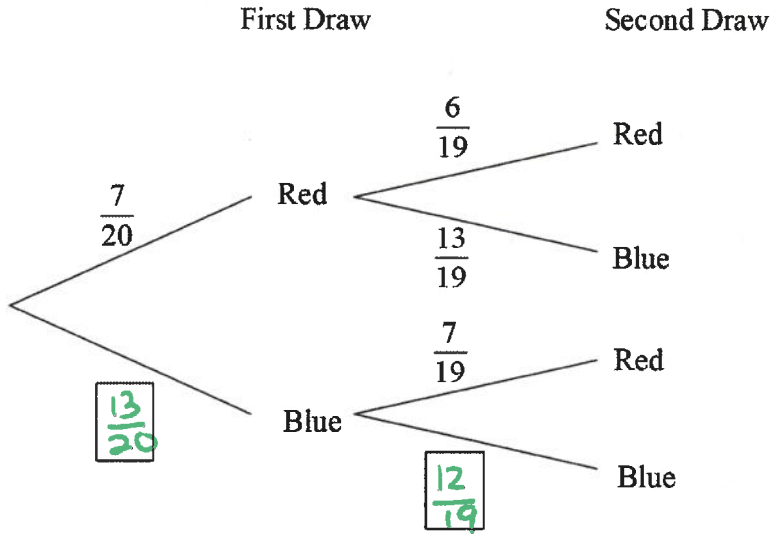
$\therefore$ price should be $23

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 25 (3 marks)

A bag contains 7 red balls and 13 blue balls. Two balls are selected at random without replacement. A partially completed tree diagram is shown below.



Complete the probability tree diagram and calculate the probability of selecting two balls of the same colour. **3**

$P(\text{same}) = P(BB) + P(RR)$

$= \frac{7}{20} \times \frac{6}{19} + \frac{13}{20} \times \frac{12}{19}$

$= \frac{99}{190}$

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 26 (3 marks)

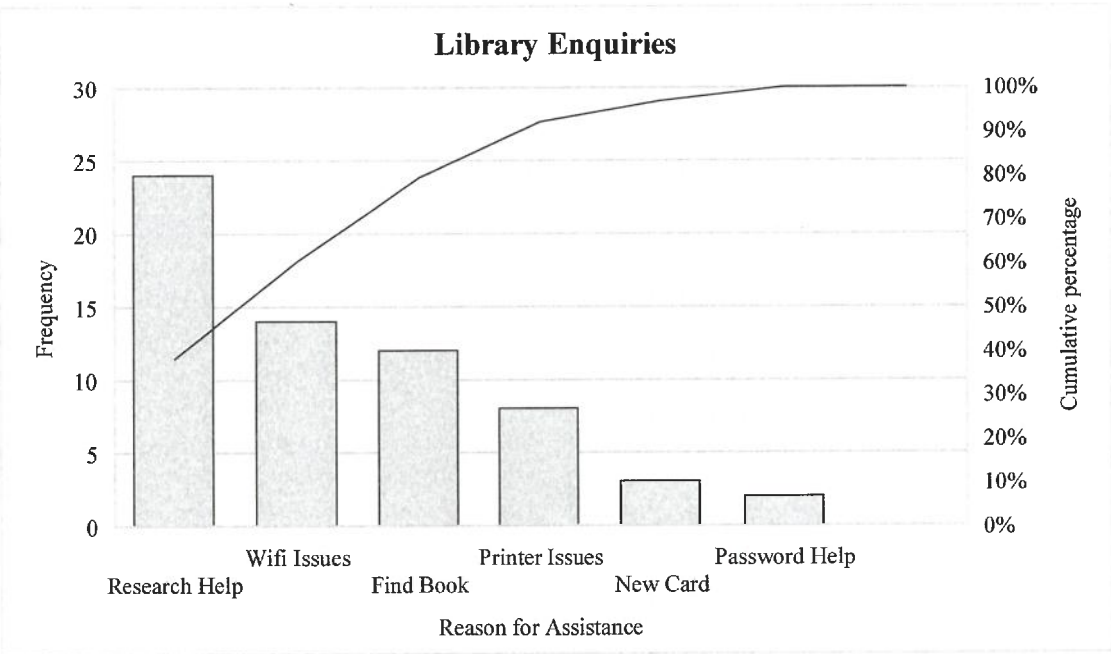
The school librarian records the reasons students visited the help desk during Term 1. She displayed the results in the table below.

Reason	*Frequency*	*Cumulative frequency*	*Cumulative percentage*
Research Help	24	24	48
Wifi Issues	***A***	28	56
Find Book	12	40	80
Printing Issues	5	***B***	90
New Card	3	48	99
Forgotten Password	2	50	100
Total	50		

a) What are the values of ***A*** and ***B***? **2**

A = 4
B = 45

b) The data from the table is shown in the following Pareto chart.



Explain ONE benefit of using a Pareto chart to display the data. **1**

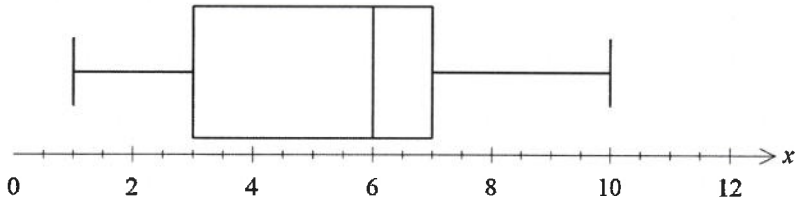
easily identifies which reasons demand 80% of the librarians attention. Further training in these areas can increase overall productivity.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 27 (2 marks)

The box and whisker plot for a dataset is given.



Is 10 an outlier? Justify your answer with calculations.

2

IQR = 7 − 3
= 4

$Q_3 + 1.5 \times IQR = 7 + 1.5 \times 4$
$= 13$

∴ 10 is NOT an outlier as it is less than 13.

Section II continues on PART B

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 28 (3 marks)

Charles's taxable income is $88 225.

The table below is used to calculate his tax payable. In addition, he pays the Medicare levy, which is 2% of his taxable income.

Taxable Income ($)	*Tax payable*
$0 – $18,200	Nil
$18 201 – $45 000	16c for each $1 over $18 200
$45 001 – $135 000	$4 288 plus 30c for each $1 over $45 000
$135 001 – $190 000	$31 288 plus 37c for each $1 over $135 000
$190 001 and over	$51 638 plus 45c for each $1 over $190 000

Calculate Charles's total tax payable.

3

Tax Payable = 4288 + 0.3(88225 − 45000)

= $17 255.50

Medicare Levy = 2% × 88225

= $1764.50

Total tax Payable = 17255.50 + 1764.5

= $19020

Do NOT write in this area.

Question 29 (5 marks)

The heights and weights of 8 preschoolers were measured and the results were recorded in the table below.

Heights and Weights of Pre-Schoolers

Height, h (cm)	102	100	105	98	104	99	103	101
Weight, w (kg)	16.5	15.2	17.8	14.6	17.2	15	16.1	15.6

a) Calculate the correlation coefficient, r. Give your answer correct to three significant figures. **1**

$r = 0.96780...$

$= 0.968$ (3s.f).

b) Comment on the strength of the correlation. **1**

Very strong.

c) Find the equation of the least squares regression line. Give the values in the equation correct to two decimal places. **2**

$A = -28.7083...$

$= -28.71$ (2dp)

$B = 0.4405...$

$= 0.44$ (2dp)

$\therefore w = -28.71 + 0.44h$

d) Using your answer from part c), make a prediction for the weight of a preschooler who is 108 cm tall. **1**

$h = 108$, $w = -28.71 + 0.44(108)$

$= 18.81$ kg.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 30 (4 marks)

Robert is buying a new car which has a sale price of $22 850.

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.

1

Stamp Duty = 229 x 3
= $687

b) The total purchase costs include a $79 registration fee, a $55 number plate fee, stamp duty and vehicle tax. Vehicle tax is calculated based on the tare weight of the vehicle. Given the car Robert purchased has a tare weight of 1250 kg and he will use the car for private use, calculate the total amount Robert pays.

Tare weight (kg)	*Private use fee*	*Business use fee*
Up to 975	$266	$429
976 to 1154	$308	$487
1155 to 1504	$374	$588
1505 to 2504	$570	$883
2505 to 2794	$822	$1,370

2

Total fees = 79 + 55 + 687 + 374
= $1195

Overall Total = 1195 + 22850
= $24 045

c) Robert has decided he will take out comprehensive car insurance in addition to the compulsory third party insurance.

State ONE extra cover that is provided by the comprehensive car insurance.

1

Damage to own car

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 31 (4 marks)

Jo has signed up for a premium gym membership that includes personal training and nutrition coaching. The upfront cost is $3600, but the gym offers a payment plan that allows members to pay in equal quarterly instalments over 2 years, with an annual interest rate of 8% p.a. compounded quarterly.

Table of present value interest factors for an annuity of $1

N \ r	*Interest rate per period as a percentage*						
	1%	2%	3%	4%	5%	6%	8%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9259
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.7833
3	2.9410	2.8839	2.8286	2.7751	2.7233	2.6730	2.5771
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3121
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	3.9927
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.6229
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.2064
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.7466

a) Find the value of each quarterly instalment Jo needs to make. **2**

PV = a × X

a = 3600 / 7.3255

= 491.4340

= $491.43.

N = 2 years

= 8 q.

r = 8% p.a.

= 2% p.q.

b) Find the total amount he will repay over the 2 years. **1**

total repayments = 491.43 × 8

= $3931.44

c) Find the total interest paid over the life of the payment plan. **1**

Interest = 3931.44 − 3600

= $331.44

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 32 (4 marks)

Sue lives in New York $(40° \text{ N}, 74° \text{ W})$. She plans to travel to Copenhagen which is $15°$ North of New York and $86°$ East of New York.

a) What is the latitude and longitude of Copenhagen?

2

55° N 12° E

b) Copenhagen is 2 hours ahead of Coordinated Universal Time (UTC +2) and New York is 5 hours behind Coordinated Universal Time (UTC -5).

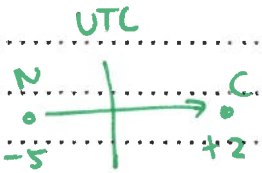
Sue travels from New York to Copenhagen. Her plane leaves New York at 6:00 pm on Friday local time and flies non-stop to Copenhagen.

The flight takes 9 hours and 50 minutes.

What time and day is it in Copenhagen when the plane lands?

2

Copenhagen Time @ Dept = 18° + 7° = 25° (next day) = 1 am Sat.



7h.

Copenhagen Time @ Arrival = 1° + 9°50° = 10:50 am Sat.

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

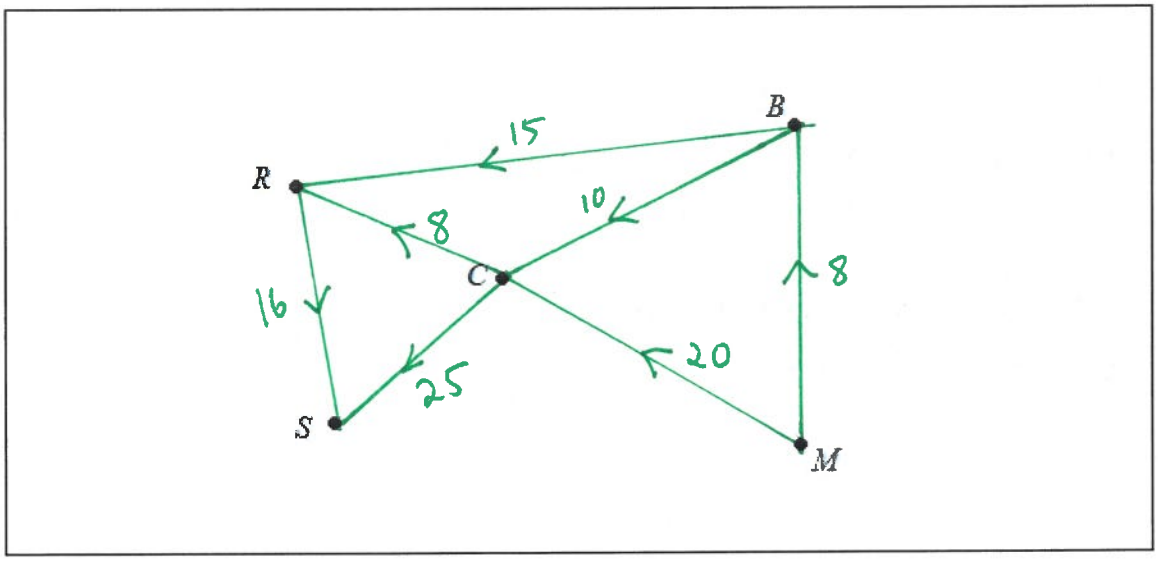
Question 33 (4 marks)

A logistics company manages deliveries between a group of towns. Each directed arrow in the network represents a one-way road used for deliveries. The company uses this network to plan the most efficient delivery paths and avoid unnecessary travel and traffic. The table below shows the distances, in kilometres, between several towns.

From:	*To:*	*Distance (km)*
Mapleton, *M*	Brookvale, *B*	8
Mapleton, *M*	Clearwater, *C*	20
Brookvale, *B*	Clearwater, *C*	10
Brookvale, *B*	Riverton, *R*	15
Clearwater, *C*	Riverton, *R*	8
Clearwater, *C*	Stonebridge, *S*	25
Riverton, *R*	Stonebridge, *S*	16

a) Using the vertices given, draw a weighted directed network diagram to represent the information shown in the table.

2



b) A delivery needs to be made from Mapleton to Stonebridge and charges \$2.30 per km travelled. What is the lowest price the company could charge for this delivery?

2

Shortest Path = 39km (M-B-R-S)

Lowest price = 39 × 2.3
= \$ 89.70

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 34 (3 marks)

CodeNest, a technology company tracks the daily step counts of its staff as part of a workplace wellness initiative.
The average daily step count is 8 000 steps, with a standard deviation of 1 200 steps.

On a particular day, Oliver recorded 5 600 steps.

a) Calculate Oliver's z-score.

1

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

$= \frac{5600-8000}{1200}$

$= -2$

b) CodeNest has a total of 280 employees. Assuming the step counts are normally distributed, approximately how many employees recorded a higher step count than Oliver on that day?

2

percentage $= 50\% + \frac{1}{2} \times 95\%$

$= 97.5\%$

No. of people $= 97.5\% \times 280$

$= 273.$

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 35 (2 marks)

Claudia has a credit card which has an interest rate of 16% per annum. The interest is compounded daily and is charged on the amount owing with no interest free period. The period for which interest is charged includes the date of purchase and the date of payment.

On 10th March, Claudia purchased tickets for \$620 using her credit card. No other purchases were made using this card for the remainder of the month.

What amount was paid when the account was paid in full on 5th April?

2

$r = \frac{16\%}{365}$ $\quad n = 31 - 10 + 1 + 5$

$= 27$

$= \frac{4}{9125}$

Amount Paid $= 620\left(1 + \frac{4}{9125}\right)^{27}$

$= 627.3800\ldots$

$= \$627.38$

Section II continues on PART C

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 36 (2 marks)

A random variable is normally distributed with mean 0 and standard deviation 1. The table below gives the probability that this random variable lies below z for different values of z.

z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	0.500	0.540	0.579	0.618	0.655	0.691	0.726	0.758	0.788	0.816
1	0.841	0.864	0.885	0.903	0.919	0.933	0.945	0.955	0.964	0.971

A manufacturer produces luxury scented candles. The mass of wax in each candle is normally distributed with a mean of 300 grams and a standard deviation of 4 grams.

What percentage of candles would you expect to contain more than 302 grams of wax?

2

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

$= \frac{302-300}{4}$

$= 0.5$

$P(x > 302) = P(z > 0.5)$

$= 1 - P(z < 0.5)$

$= 1 - 0.691$

$= 0.309$

$= 30.9\%$

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 37 (3 marks)

An outdoor adventurer uses a pedal-powered generator to recharge the battery of her satellite communication device while camping off-grid.
While pedalling she burns energy at a rate of 720 kilocalories per hour. The generator converts this energy and stores it as electricity in the device's battery.

Her satellite device requires 1.8 kWh of electricity per day. How long must she pedal each day to generate enough energy to power the device?

Give your answer in hours and minutes, correct to the nearest minute.
Note: 1 kcal = 4.184 kj and 3600 kj = 1 kWh

3

1kwh = 3600kj
1.8kwh = 6480kj

1k Cal = 4.184kj
720k Cal = 3012.48kj

Time Taken = $\frac{6480}{3012.48}$
= 2° 9' 3.79"
= 2h 9min (nmin)

Do NOT write in this area.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

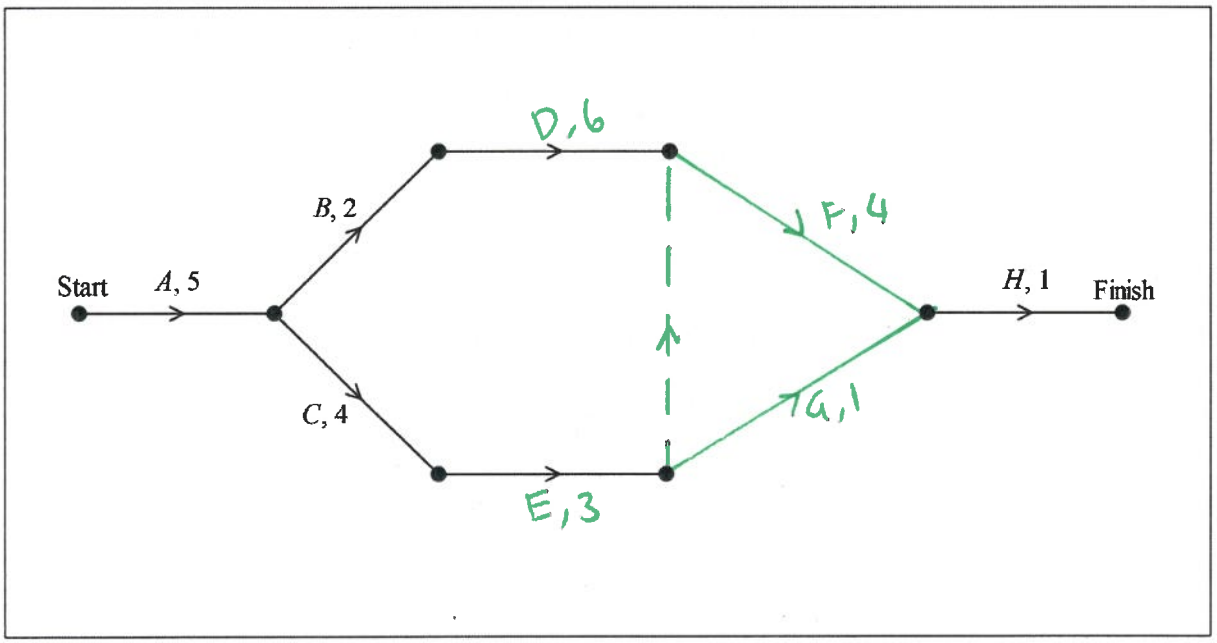
Question 38 (6 marks)

The drama department at a school is planning a school musical production. The following table outlines the key activities, their durations and which activities must be completed before others can begin.

Activity	Description	Duration (weeks)	Predecessor(s)
A	Write script	5	—
B	Audition cast	2	*A*
C	Design set and costumes	4	*A*
D	Cast rehearsals	6	*B*
E	Build set and create costumes	3	*C*
F	Rehearse with full staging	4	*D, E*
G	Technical setup (lighting/sound)	1	*E*
H	Final dress rehearsal	1	*F, G*

a) Complete the network diagram for the school musical production.

2



b) Identify the critical path and determine the minimum time needed to complete the project.

2

critical path = A - B - D - F - H

min time = 18 weeks.

Question 38 continues on page 5

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 38 (continued)

c) What is the float time for Activity *E*?

1

float = 13 - 9 - 3
time = 1 week.

d) Activity *C* is delayed by 3 weeks causing a delay to the entire production. By how many weeks is the overall production delayed?

1

float = 10 - 5 - 4 ∴ production
time = 1 week delayed by 2 weeks

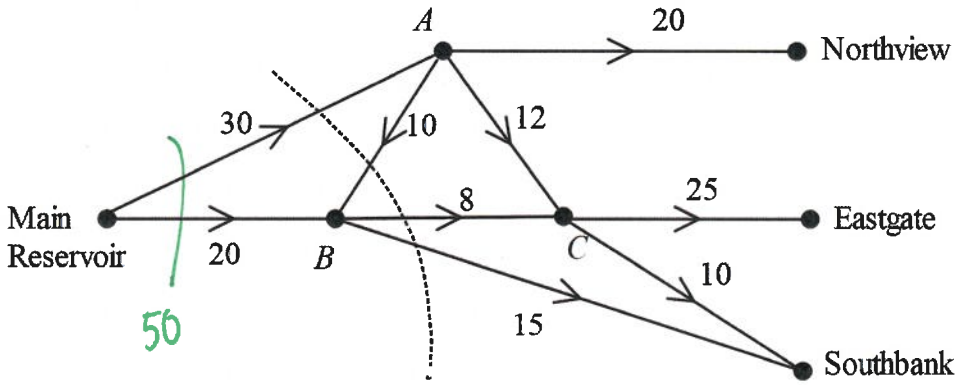
Do NOT write in this area

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Question 39 (4 marks)

HydroCity is a city that relies on a network of water pipes to supply clean water from its main reservoir to three different suburbs: Northview, Eastgate, and Southbank. The system is represented by a flow network where each pipe has a maximum capacity in kilolitres per hour.

The diagram below shows the layout of the water distribution system. Each edge is labelled with the maximum flow capacity of that pipe.



a) Calculate the capacity of the cut drawn on the network above.

1

capacity = 30 + 8 + 15
= 53k L/h.

b) Determine the maximum flow of the network.

1

Max Flow = 50kL/h.

c) Pipe *BC* is due for repairs and will undergo a renovation that will increase its capacity. Will the increase in capacity in Pipe *BC* change the maximum flow of the network? Justify your answer with mathematical reasoning or calculation.

2

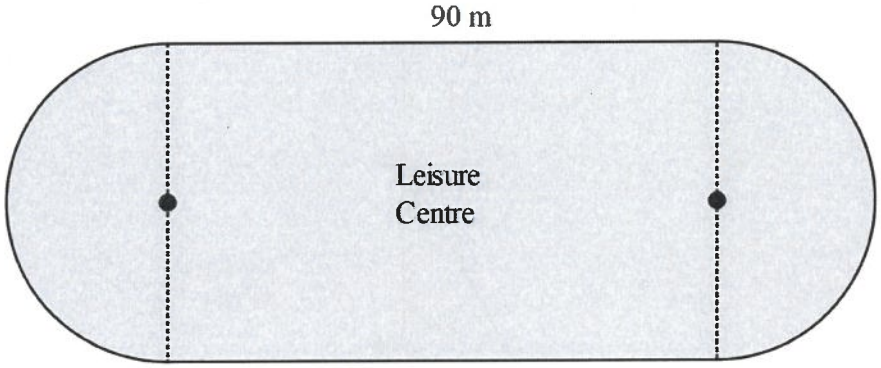
No, since the outflow at the source is already at capacity no additional water can flow through the system. (Min cut does not go through BC).

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 40 (4 marks)

A new leisure centre is designed with a running track on its perimeter. The track follows the entire outer edge of the shape below, which comprises of a rectangle and two semi-circles.



a) The length of the running track is 400 m. Find the length of the diameter of the semicircles, give your answer correct to the nearest whole metre.

2

$90 + 90 + \pi d = 400$

$\pi d = 220$

$d = 70.028\ldots$

$= 70\text{m}$ (n. whole).

or $2\pi r + 90 + 90 = 400$

$\vdots$

$r = 35$

$d = 70$

b) It takes Piper 2 minutes to run around the track. What was Piper's average speed in kilometres per hour?

2

$S = \frac{d}{t}$

$= \frac{400\text{m}}{2\text{min}}$

$= \frac{200\text{m}}{1\text{min}} \frac{\times 60}{\times 60}$

$= 12\,000\text{ m/h}$

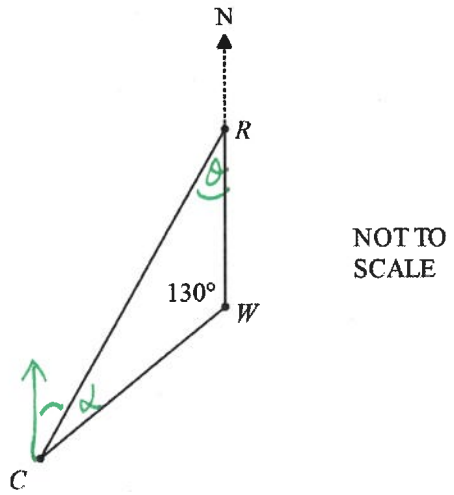
$= 12\text{ km/h}$.

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 41 (4 marks)

The diagram below shows the location of three landmarks in a national park: a Ranger Station R, a Waterfall W, and a Campsite C. The Ranger Station R is due north of the Waterfall W and $\angle RWC$ is $130°$.



Isla and Gabriel decide to go on solo hikes from the Waterfall. They both leave at 2 pm. Following a direct route, Isla arrives at the Ranger Station at 3 pm. She travels at a speed of 5 km/h. Gabriel travels directly to the Campsite and arrives at 4 pm. Gabriel travels at a speed of 7 km/h.

a) Show that the shortest distance between Isla and Gabriel when they have reached their destinations is 18 km. Give your answer to the nearest kilometre.

2

RW = 5km

CW = 2×7
= 14km

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

$RC^2 = 5^2 + 14^2 - 2(5)(14)\cos 130°$

$= 310.99...$

$RC = 17.634..$

$= 18\text{km}$ (1. km)

Question 41 continues on page 9

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 41 (continued)

b) By letting $RC = 18$ km, as shown in part a), determine the bearing of the Ranger Station from the Campsite. Give your answer correct to the nearest degree.

2

$\frac{\sin\theta}{14} = \frac{\sin 130}{18}$

$\sin\theta = \frac{14\sin 130}{18}$

$\theta = 36.57\ldots$

$= 37°$ (n.degree)

Bearing = 037° (alternate ∠s are equal on parallel lines)
R not required.

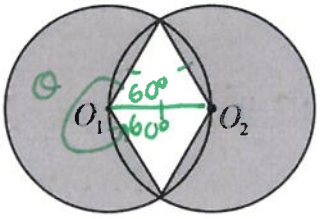
(Bearing = 038° by find α 1st)
(Bearing = 032° by using cos rule) ← alt solutions due to using rounded RC = 18km

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.

Question 42 (3 marks)

Jenna is designing a logo for a school project using circles with a diamond feature in the middle.



The centre of each circle lies on the circumference of the other.
Both circles have the same radius of 4 centimetres.

Jenna needs to calculate the shaded area to work out how much glitter to buy for her project.
Find the shaded area, give your answer correct to two decimal places.

3

$\theta = 360 - 60 - 60$

$= 240$

$A = 2\left(\frac{240}{360} \times \pi \times 4^2\right)$

$= 67.0206\ldots$

$= 67.02\ cm^2$ (2dp)

End of paper

Ascham School Use Only – Do NOT write anything, or make any marks below this line

Do NOT write in this area.