2018 HIGHER SCHOOL CERTIFICATE EXAMINATION

Mathematics General 2

General Instructions	• Reading time – 5 minutes • Working time – $2\frac{1}{2}$ hours • Write using black pen • Calculators approved by NESA may be used • A formulae and data sheet is provided at the back of this paper • In Questions 26–30, show relevant mathematical reasoning and/or calculations
Total marks: 100	**Section I – 25 marks** (pages 2–12) • Attempt Questions 1–25 • Allow about 35 minutes for this section **Section II – 75 marks** (pages 13–36) • Attempt Questions 26–30 • Allow about 1 hour and 55 minutes for this section

Section I

25 marks
Attempt Questions 1–25
Allow about 35 minutes for this section

Use the multiple-choice answer sheet for Questions 1–25.

1   A set of scores has the following five-number summary.

lower extreme = 2
lower quartile = 5
median = 6
upper quartile = 8
upper extreme = 9

What is the range?

A.   2

B.   3

C.   6

D.   7

2   What is the value of $3x^0 + 1$?

A.   1

B.   2

C.   3

D.   4

3   A survey asked the following question.

'How many brothers do you have?'

How would the responses be classified?

A.   Categorical, ordinal

B.   Categorical, nominal

C.   Quantitative, discrete

D.   Quantitative, continuous

4   Which graph best represents the equation $y = x^2 - 2$?

A.
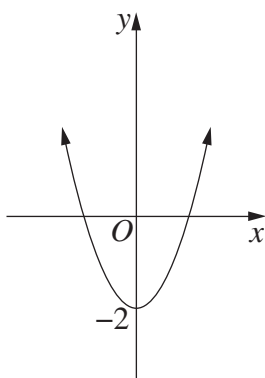
B.
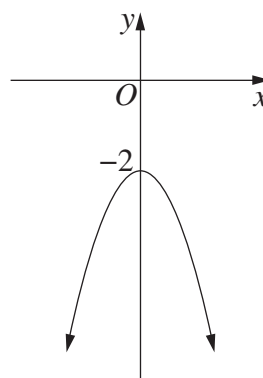
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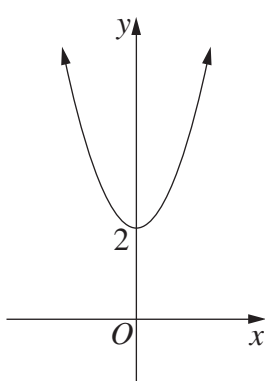
D.
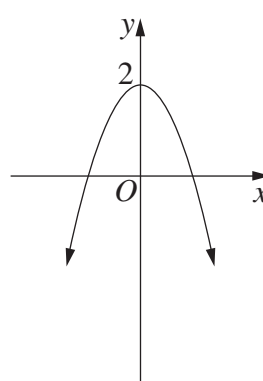
5   The driving distance from Alex's home to his work is 20 km. He drives to and from work five times each week. His car uses fuel at the rate of 8 L/100 km.

How much fuel does he use driving to and from work each week?

A.   16 L

B.   20 L

C.   25 L

D.   40 L

6 A set of data is displayed in this dot plot.
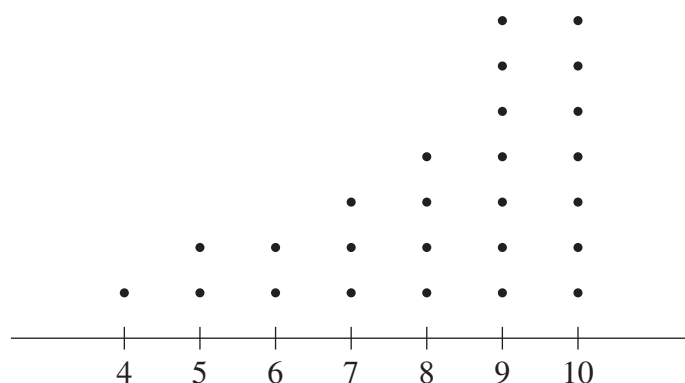
Which of the following best describes this set of data?

A.   Symmetrical

B.   Positively skewed

C.   Negatively skewed

D.   Normally distributed

7 The diagram shows the positions of towns *A*, *B* and *C*.

Town *A* is due north of town *B* and $\angle CAB = 34°$.

NOT TO SCALE
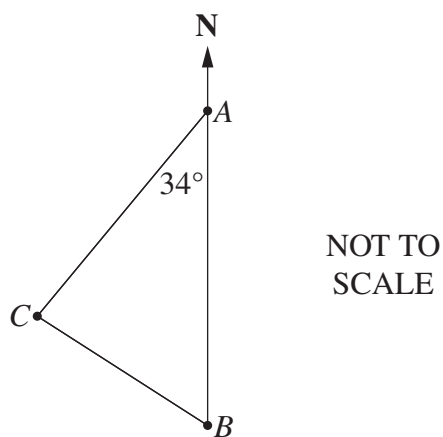
What is the bearing of town *C* from town *A*?

A.   034°

B.   146°

C.   214°

D.   326°

8   A nanny charges $15 per hour, or part thereof, for looking after a child.

What does the nanny charge for looking after a child from 8 am until 3.20 pm on a particular day?

A. $105

B. $108

C. $110

D. $120

9   An experiment has three distinct outcomes, *A*, *B* and *C*. Outcome *A* occurs 50% of the time. Outcome *B* occurs 23% of the time.

What is the expected number of times outcome *C* would occur if the experiment is conducted 500 times?

A.   115

B.   135

C.   250

D.   365

10   A biologist caught a random sample of 56 parrots in a national park. She tagged them and then released them. She later returned to the park and caught a random sample of 47 parrots. In this sample 29 had been tagged.

Using the capture/recapture technique, what is the estimated number of parrots in the park?

A.   35

B.   74

C.   91

D.   132

11 A set of data is summarised in this frequency distribution table.

Score	Frequency
3	1
4	2
5	6
6	7
7	9
8	5
	Total = 30

Which of the following is true about the data?

A.   Mode = 7, median = 5.5

B.   Mode = 7, median = 6

C.   Mode = 9, median = 5.5

D.   Mode = 9, median = 6

12 The diagram shows a triangle with side lengths 8 m, 9 m and 10 m.

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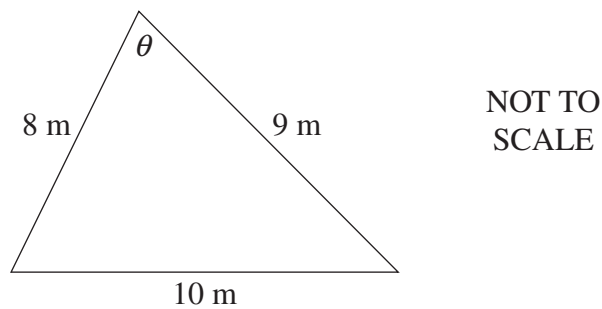
What is the value of θ, marked on the diagram, to the nearest degree?

A.   49°

B.   51°

C.   59°

D.   72°

13 A rectangular pyramid has base side lengths $3x$ and $4x$. The perpendicular height of the pyramid is $2x$. All measurements are in metres.
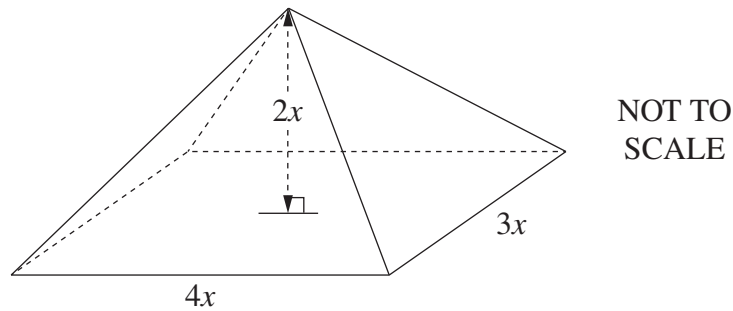
What is the volume of the pyramid in cubic metres?

A. $8x^3$

B. $9x^3$

C. $12x^3$

D. $24x^3$

14 To determine the retail price of an item, a shop owner increases its cost price by 30%. In a sale, the retail price is reduced by 30% to give the sale price.

How does the sale price compare to the cost price?

A. The sale price is less than the cost price.

B. The sale price is the same as the cost price.

C. The sale price is more than the cost price.

D. It is impossible to compare without knowing the cost price.

15 Sam is the driver at fault in a car accident.

Which of the following is covered by Sam's compulsory third-party (CTP) insurance?

A. Repairs to Sam's car

B. Injury to the other driver

C. Damage to the other driver's car

D. Cost of repairing a building damaged in the accident

16 Which expression is equivalent to $\dfrac{k^2}{10} \div \dfrac{5}{k}$?

A. $\dfrac{2}{k}$

B. $\dfrac{k}{2}$

C. $\dfrac{50}{k^3}$

D. $\dfrac{k^3}{50}$

17 The area chart shows the number of students involved in tennis or cricket at a school over a number of years.
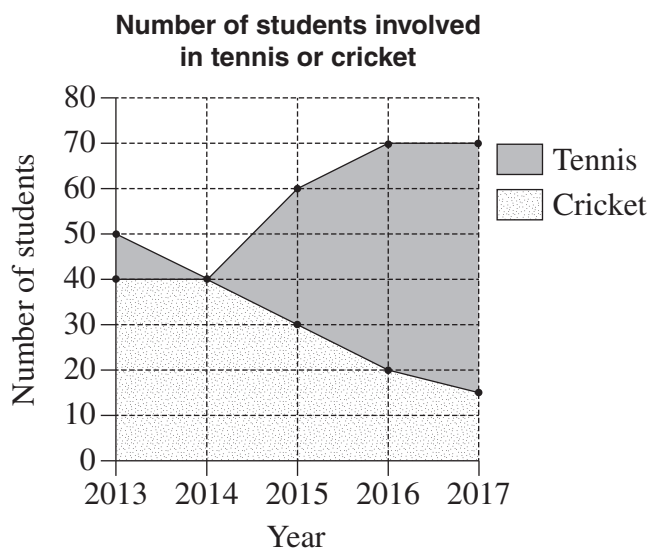
In which year was the number of students involved in tennis equal to the number of students involved in cricket?

A. 2013

B. 2014

C. 2015

D. 2016

18   The length of a window is measured as 2.4 m.

Which calculation will give the percentage error for this measurement?

A. $\pm\left(\dfrac{0.05}{2.4}\right) \times 100$

B. $\pm\left(\dfrac{0.05}{100}\right) \times 2.4$

C. $\pm\left(\dfrac{0.5}{2.4}\right) \times 100$

D. $\pm\left(\dfrac{0.5}{100}\right) \times 2.4$

19   The table shows the compounded values of $1 at different interest rates over different periods.

Compounded values of $1

Number of periods	Interest rate per period				
	1%	2%	3%	4%	5%
2	1.0201	1.0404	1.0609	1.0816	1.1025
4	1.0406	1.0824	1.1255	1.1699	1.2155
6	1.0615	1.1262	1.1941	1.2653	1.3401
8	1.0829	1.1717	1.2668	1.3686	1.4775
10	1.1046	1.2190	1.3439	1.4802	1.6289
12	1.1268	1.2682	1.4258	1.6010	1.7959

Amy hopes to have $21 000 in 2 years to buy a car. She opens an account today which pays interest of 4% pa, compounded quarterly.

Using the table, which expression calculates the minimum single sum that Amy needs to invest today to ensure she reaches her savings goal?

A.   21 000 × 1.0816

B.   21 000 ÷ 1.0816

C.   21 000 × 1.0829

D.   21 000 ÷ 1.0829

20 During a year, the maximum temperature each day was recorded. The results are shown in the table.

	Number of days with maximum temperature less than 25°C	Number of days with maximum temperature greater than or equal to 25°C	Total number of days
Summer	42	48	90
Autumn	57	35	92
Winter	71	21	92
Spring	53	38	91
Total number of days	223	142	365

From the days with a maximum temperature less than 25°C, one day is selected at random.

What is the probability, to the nearest percentage, that the selected day occurred during winter?

A.   19%

B.   25%

C.   32%

D.   77%

21 David earns a gross income of $890 per week. Each week, 25% of this income is deducted in taxation. David budgets to save 20% of his net income.

How much does he budget to save each week?

A. $44.50

B. $133.50

C. $489.50

D. $534.00

22 A shape consisting of a quadrant and a right-angled triangle is shown.

NOT TO
SCALE

6 cm

10 cm
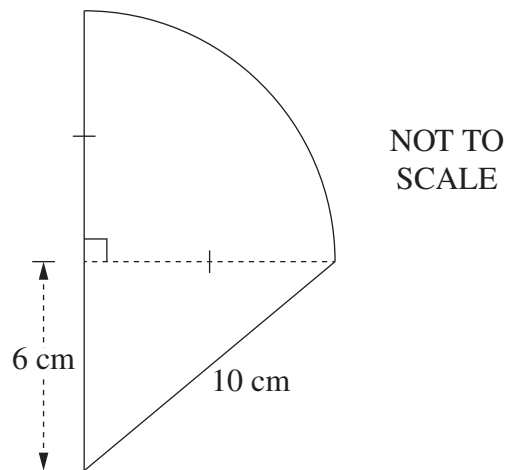
What is the perimeter of this shape, correct to one decimal place?

A.   28.6 cm

B.   36.6 cm

C.   66.3 cm

D.   74.3 cm

23 A set of data is normally distributed with a mean of 48 and a standard deviation of 3.

Approximately what percentage of the scores lies between 39 and 45?

A.   15.85%

B.   31.7%

C.   47.5%

D.   49.85%

24 The coordinates of city A are (39°N, 75°W). City B lies on the same longitude and is 5700 km south of city A.

What is the latitude of city B?

A. 51°N

B. 51°S

C. 12°N

D. 12°S

25 Which of the following expresses v as the subject of $k = \dfrac{1}{2}mv^2$?

A. $v = \pm\sqrt{\dfrac{2k}{m}}$

B. $v = \pm\dfrac{\sqrt{k}}{2m}$

C. $v = \pm\sqrt{\dfrac{k}{2m}}$

D. $v = \pm\dfrac{2\sqrt{k}}{m}$

Centre Number

Student Number

Mathematics General 2
Section II Answer Booklet

75 marks
Attempt Questions 26–30
Allow about 1 hour and 55 minutes for this section

Instructions
- Write your Centre Number and Student Number at the top of this page.

- 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

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Question 26 (15 marks)

(a) Jeremy rolled a biased 6-sided die a number of times. He recorded the results in a table.　　**1**

Number	1	2	3	4	5	6
Frequency	23	19	48	20	21	19

What is the relative frequency of rolling a 3?

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(b) Clark's formula, given below, is used to determine the dosage of medicine for children.　　**2**

$$\text{Dosage} = \frac{\text{weight in kg} \times \text{adult dosage}}{70}$$

For a particular medicine, the adult dosage is 325 mg and the correct dosage for a specific child is 90 mg.

How much does the child weigh, to the nearest kg?

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(c) Ali made monthly deposits of $100 into an annuity for 5 years.　　**1**

Calculate the total amount Ali deposited into the annuity over this period.

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Question 26 (continued)

(d)   The graph displays the mean monthly rainfall in Sydney and Perth.

Mean monthly rainfall in Sydney and Perth
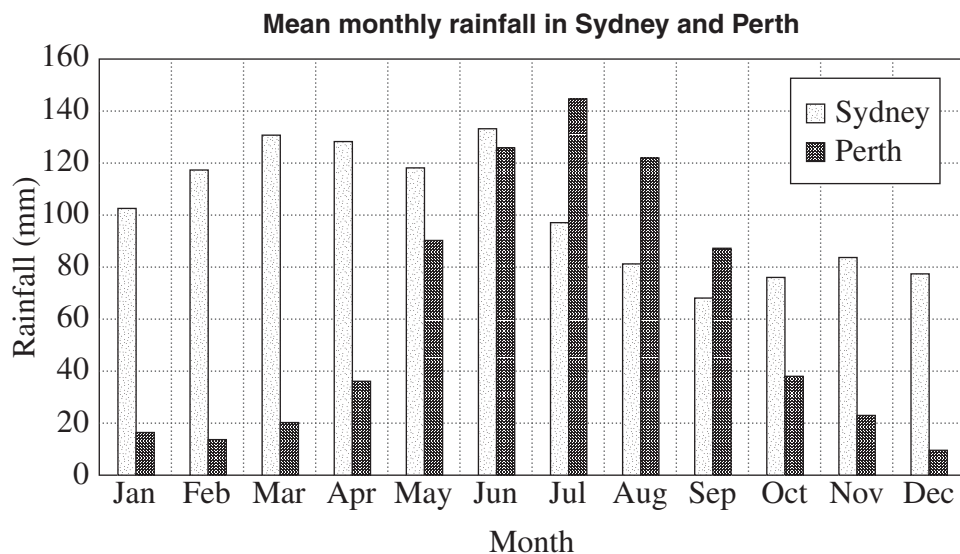
(i)   For how many months is the mean monthly rainfall higher in Perth than   **1**
in Sydney?

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(ii)   For which of the two cities is the standard deviation of the mean monthly   **1**
rainfall smaller? Justify your answer WITHOUT calculations.

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Question 26 continues on page 16

Office Use Only – Do NOT write anything, or make any marks below this line.

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Question 26 (continued)

(e) A cumulative frequency table for a data set is shown. **2**

Score	Cumulative frequency
1	5
2	9
3	16
4	20
5	34
6	42

What is the interquartile range of this data set?

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Question 26 continues on page 17

Question 26 (continued)

(f)   A toy shop sells buckets and spades separately. Buckets are available in one of   **1**
       six colours. Spades are also available in one of the same six colours.

       Abdul wants to buy a bucket-and-spade set where the bucket and spade are of
       different colours.

       How many different bucket-and-spade sets are possible for Abdul to buy?

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Question 26 continues on page 18

(g) A field diagram of a block of land has been drawn to scale. The shaded region *ABFG* is covered in grass.
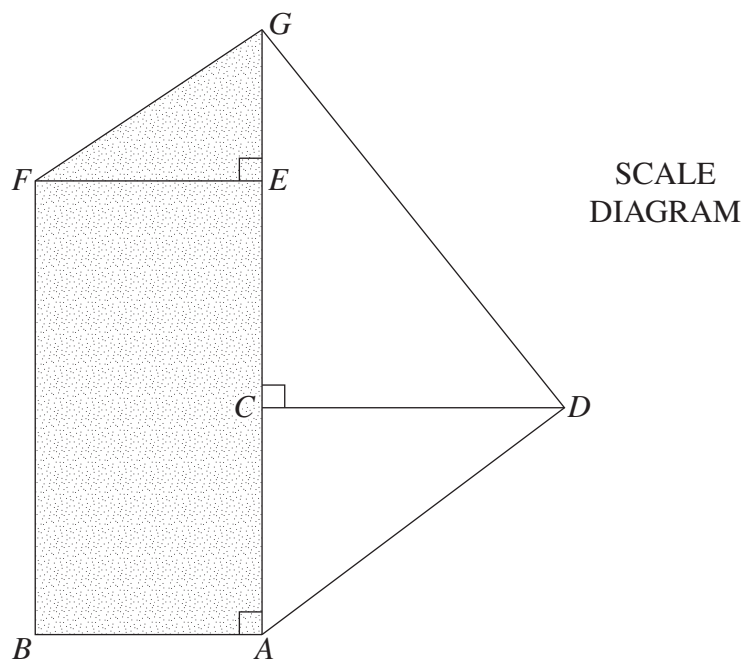
SCALE
DIAGRAM

The actual length of *AG* is 24 m.

(i) Show that the scale of the diagram is 1 cm = 3 m. **1**

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Question 26 continues on page 19

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Question 26 (continued)

(ii) How much fertiliser would be needed to fertilise the grassed area *ABFG* at the rate of 26.5 g/m^2?

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(h) A car is purchased for $23 900.

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The value of the car is depreciated by 11.5% each year using the declining-balance method.

What is the value of the car after three years?

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End of Question 26

Question 27 (15 marks)

(a) Jenny used her mobile phone while she was overseas for one month. **2**

Her mobile phone plan has a base monthly cost of $50. While overseas, she is also charged 33 cents per SMS message sent and 26 cents per MB of data used.

During her month overseas, Jenny sent 120 SMS messages and used 1400 MB of data.

What was her mobile phone bill for the month overseas?

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(b) Find the values of *x* and *y* which satisfy the following equations simultaneously. **3**

$$y = x + 5$$
$$3y - x = 7$$

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Question 27 (continued)

(c) A shade shelter is to be constructed in the shape of half a cylinder with open ends. The diameter is 3.8 m and the length is 10 m. **2**

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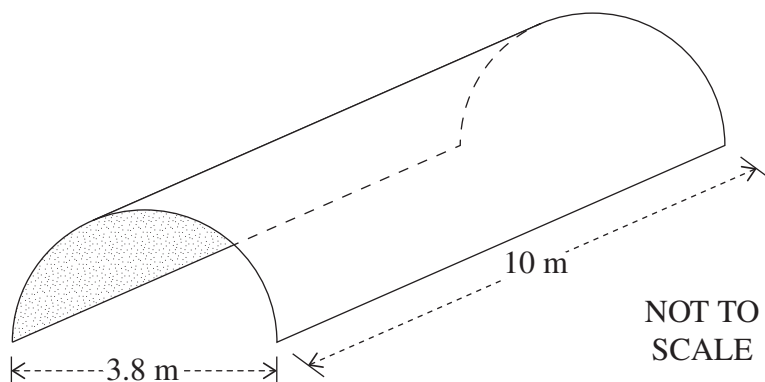
The curved roof is to be made of plastic sheeting.

What area of plastic sheeting is required, to the nearest m^2?

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Question 27 continues on page 22

(d)   The graph displays the cost (c) charged by two companies for the hire of a minibus for x hours.
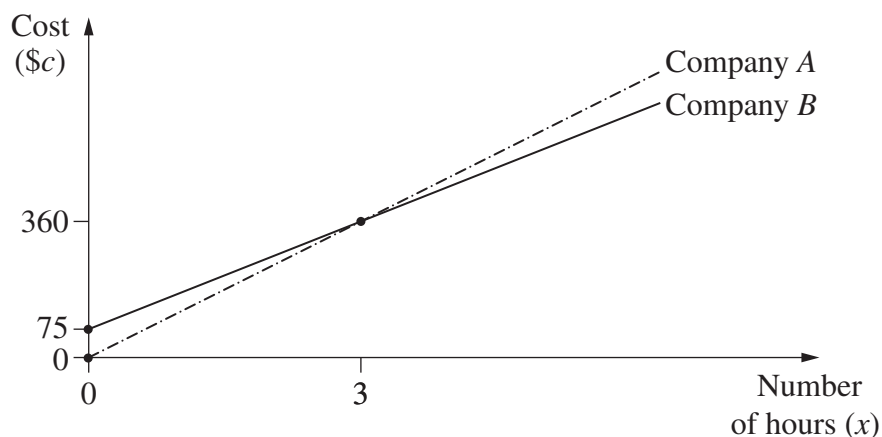
Both companies charge $360 for the hire of a minibus for 3 hours.

(i)   What is the hourly rate charged by Company A?   **1**

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(ii)   Company B charges an initial booking fee of $75.   **2**

Write a formula, in the form of $c = mx + b$, for the cost of hiring a minibus from Company B for x hours.

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(iii)   A minibus is hired for 5 hours from Company B.   **2**

Calculate how much cheaper this is than hiring from Company A.

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Question 27 (continued)

(e) Joanna sits a Physics test and a Biology test.

(i) Joanna's mark in the Physics test is 70. The mean mark for this test is 58 **1**
and the standard deviation is 8.

Calculate the *z*-score for Joanna's mark in this test.

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(ii) In the Biology test, the mean mark is 64 and the standard deviation is 10. **2**

Joanna's *z*-score is the same in both the Physics test and the Biology test.

What is her mark in the Biology test?

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End of Question 27

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Question 28 (15 marks)

(a) A field is bordered on one side by a straight road and on the other side by a river, **3**
as shown. Measurements are taken perpendicular to the road every 7.5 metres
along the road.
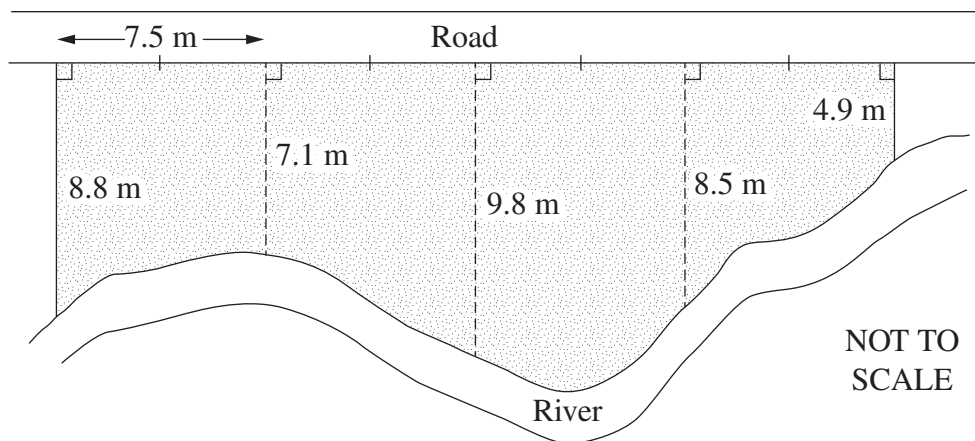
Use TWO applications of Simpson's Rule to find an approximation to the area
of the field.

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Question 28 continues on page 25

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Question 28 (continued)

(b)   Solve the equation $\dfrac{2x}{5} + 1 = \dfrac{3x + 1}{2}$, leaving your answer as a fraction.   **3**

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(c)   Every day, a 1200-watt microwave oven is used for 45 minutes at 40% power.   **3**
      Electricity is charged at $0.25 per kWh.

      What is the cost of running this microwave oven for 180 days?

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Question 28 (continued)

(d) Yanika opens a new credit card account, with interest and fees as shown.

Interest
• Flat rate of 12.3% per annum
• No interest-free period

Fees
• $0 for online repayments
• $3 for repayments in cash
(fee added to balance immediately after repayment)

Yanika makes a single purchase of $849 with the credit card.

(i) Show that the balance owing on the credit card 24 days after making the purchase is $855.87.

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(ii) Yanika makes her first repayment 24 days after making the purchase. She makes a cash repayment of $450.

What is the balance owing on the credit card immediately after her repayment is made and the repayment fee has been charged?

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Question 28 continues on page 27

(e) Sophie is driving at 70 km/h. She notices a branch on the road ahead and decides to apply the brakes. Her reaction time is 1.5 seconds. Her braking distance (D metres) is given by $D = 0.01v^2$, where v is speed in km/h. **3**

What is Sophie's stopping distance, to the nearest metre?

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End of Question 28

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Question 29 (15 marks)

(a)   The time in Brisbane is $4\frac{1}{2}$ hours ahead of the time in New Delhi. John flew   **3**
from New Delhi to Brisbane via Singapore. His plane left New Delhi at
11.30 am (New Delhi time), stopped for 3 hours in Singapore, and arrived in
Brisbane at 9.00 am the following day (Brisbane time).

What was the plane's total flying time?

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(b)   A TV program which has a file size of 495 MB (megabytes) is to be downloaded.   **2**
The download speed is 82.7 megabits per second.

How long will it take to download this program? Give your answer correct to
the nearest second. (Note: 1 megabit = 1 000 000 bits)

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– 28 –

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Question 29 (continued)

(c) When people walk in snow, the depth (D cm) of each footprint depends on both the area (A cm^2) of the shoe sole and the weight of the person.

The graph shows the relationship between the area of the shoe sole and the depth of the footprint in snow, for a group of people of the same weight.

Depth of footprint versus area of shoe sole
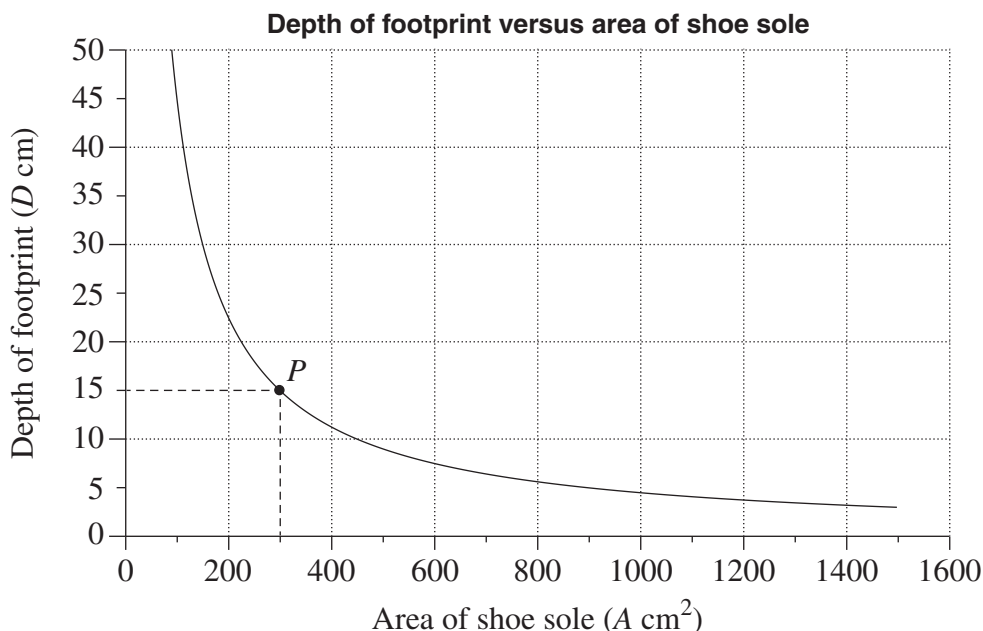
(i) The graph is a hyperbola because D is inversely proportional to A. The point P lies on the hyperbola.   **2**

Find the equation relating D and A.

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(ii) A man from this group walks in snow and the depth of his footprint is 4 cm.   **1**

Use your equation from part (i) to calculate the area of his shoe sole.

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Question 29 continues on page 30

– 29 –

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Question 29 (continued)

(d) Data for life expectancy (expected remaining years of life) for females at selected ages are given in the table.

Age (x years)	Life expectancy (y years) for females
0	84.6
5	79.9
10	74.9
15	69.9
20	65.0
25	60.1
30	55.1
35	50.2
40	45.4
$\bar{x} = 20$	$\bar{y} = 65.01$ (to 2 decimal places)

(i) A student is finding the equation of the least-squares line of best fit relating the life expectancy (y) for females and their age (x).

The student has calculated the gradient to be -0.984.

Use this value and the given values for $\bar{x}$ and $\bar{y}$ to show that the y-intercept of the line is 84.69.

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(ii) A student uses the least-squares line of best fit from part (i) to estimate the life expectancy of her grandmother who is currently aged 87.

Explain why this does NOT give a valid estimate.

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Question 29 continues on page 31

– 30 –

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Question 29 (continued)

(iii) Sally is a female aged 37. **1**

Use the least-squares line of best fit for females, $y = -0.984x + 84.69$, to calculate her life expectancy.

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(iv) For males, the least-squares line of best fit relating life expectancy (y) and age (x) has the equation $y = -0.972x + 80.44$. **2**

James is a male. He marries Sally who is aged 37. On their wedding day, they have the same life expectancy.

Calculate James's age on their wedding day. Give your answer in years.

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(e) Andrew borrowed \$20 000 to be repaid in equal monthly repayments of \$243 over 10 years. Having made this monthly repayment for 4 years, he increased his monthly repayment to \$281. As a result, Andrew paid off the loan one year earlier. **2**

How much less did he repay altogether by making this change?
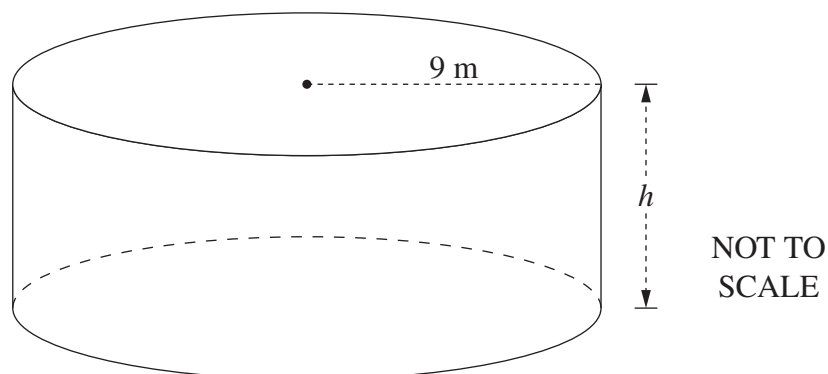
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End of Question 29

Question 30 (15 marks)

(a)   A cylindrical water tank has a radius of 9 metres and a capacity of 1.26 megalitres.   **3**

9 m

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What is the height of the water tank? Give your answer in metres, correct to two
decimal places.

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(b)   Last year, Luke's taxable income was $87 000 and the tax payable on this income was $19 822. This year, Luke's taxable income has increased by $16 800.

   (i)   Use the table to calculate the tax payable by Luke this year.   **2**

Taxable income ($)	Tax payable
$0 – $18 200	Nil
$18 201 – $37 000	19c for each $1 over $18 200
$37 001 – $87 000	$3572 plus 32.5c for each $1 over $37 000
$87 001 – $180 000	$19 822 plus 37c for each $1 over $87 000
$180 001 and over	$54 232 plus 45c for each $1 over $180 000

© Australian Taxation Office

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   (ii)   How much extra money will Luke have this year, after paying tax, as a result of the increase in his taxable income? Ignore the Medicare levy.   **2**

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Question 30 continues on page 34

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(c)   The diagram shows two triangles.   **3**

Triangle *ABC* is right-angled, with *AB* = 13 cm and ∠*ABC* = 62°.

In triangle *ACD*, *AD* = *x* cm and ∠*DAC* = 40°. The area of triangle *ACD* is 30 cm².

A

40°

x cm

NOT TO
SCALE

13 cm

30 cm²

D

62°

B   *C*
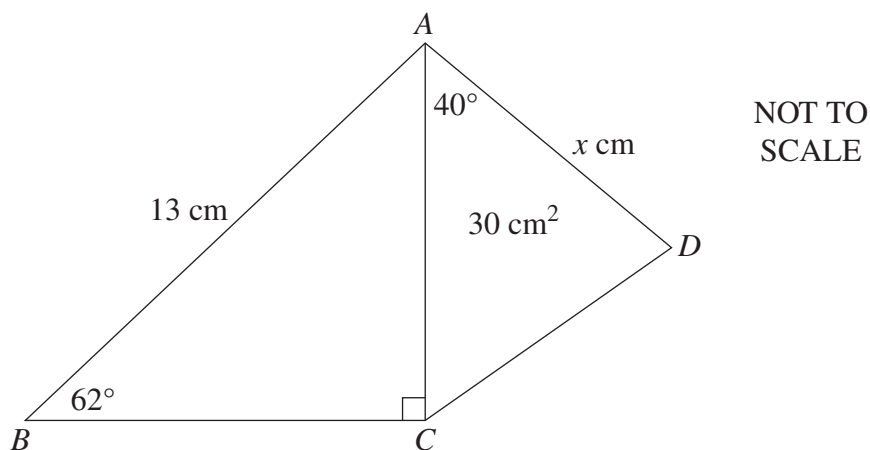
What is the value of *x*, correct to one decimal place?

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Question 30 continues on page 35

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(d) A game consists of two tokens being drawn at random from a barrel containing 20 tokens. There are 17 tokens labelled 10 cents and 3 tokens labelled $2. The player wins the total value of the two tokens drawn.

(i) Complete the probability tree by writing the missing probabilities in the boxes. **2**

1st token   *2nd token*

$\frac{16}{19}$ 10 cents   Win 20 cents

10 cents

$\frac{17}{20}$

☐ $2   Win $2.10

☐ 10 cents   Win $2.10

$2

☐ $2   Win $4
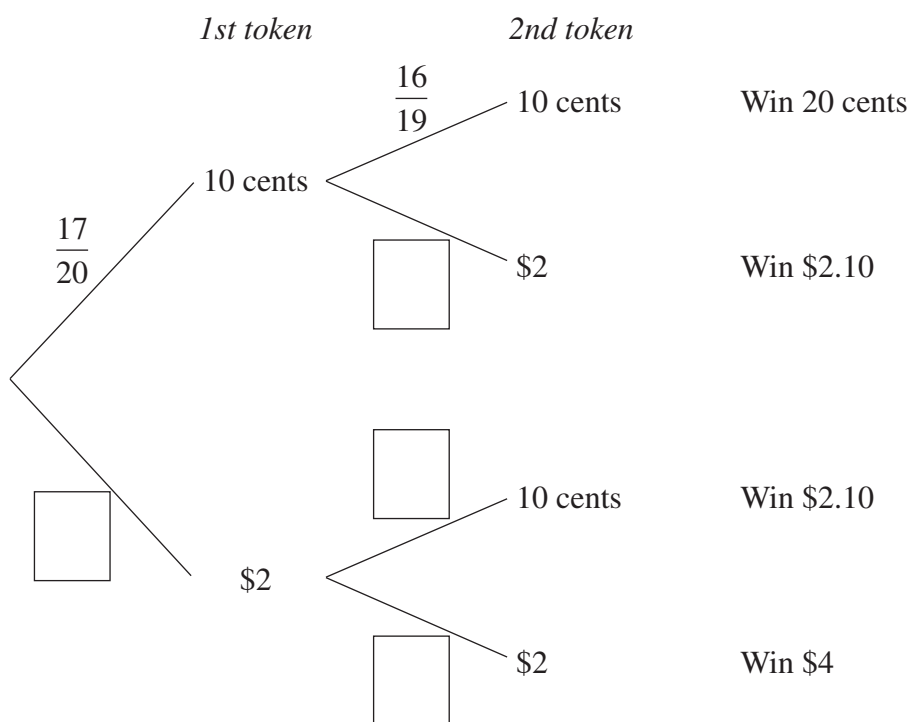
(ii) Considering that the game costs $1 to play, calculate the financial expectation of the game. **3**

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End of paper

Section II extra writing space

If you use this space, clearly indicate which question you are answering.

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Mathematics General 2

FORMULAE AND DATA SHEET

Financial Mathematics

Simple interest

$$I = Prn$$

P is initial amount

r is interest rate per period, expressed as a decimal

n is number of periods

Compound interest

$$A = P\left(1 + r\right)^n$$

A is final amount

P is initial amount

r is interest rate per period, expressed as a decimal

n is number of compounding periods

Present value and future value

$$PV = \frac{FV}{\left(1 + r\right)^n}, \qquad FV = PV\left(1 + r\right)^n$$

r is interest rate per period, expressed as a decimal

n is number of compounding periods

Straight-line method of depreciation

$$S = V_0 - Dn$$

S is salvage value of asset after n periods

V_0 is initial value of asset

D is amount of depreciation per period

n is number of periods

Declining-balance method of depreciation

$$S = V_0\left(1 - r\right)^n$$

S is salvage value of asset after n periods

V_0 is initial value of asset

r is depreciation rate per period, expressed as a decimal

n is number of periods

Data Analysis

Mean of a sample

$$\overline{x} = \frac{\text{sum of scores}}{\text{number of scores}}$$

z-score

For any score x,

$$z = \frac{x - \overline{x}}{s}$$

$\overline{x}$ is mean

s is standard deviation

Outlier(s)

score(s) less than $Q_L - 1.5 \times IQR$

or

score(s) more than $Q_U + 1.5 \times IQR$

Q_L is lower quartile

Q_U is upper quartile

IQR is interquartile range

Least-squares line of best fit

$$y = \text{gradient} \times x + y\text{-intercept}$$

$$\text{gradient} = r \times \frac{\text{standard deviation of } y \text{ scores}}{\text{standard deviation of } x \text{ scores}}$$

$$y\text{-intercept} = \overline{y} - \left(\text{gradient} \times \overline{x}\right)$$

r is correlation coefficient

$\overline{x}$ is mean of x scores

$\overline{y}$ is mean of y scores

Normal distribution

- approximately 68% of scores have z-scores between −1 and 1

- approximately 95% of scores have z-scores between −2 and 2

- approximately 99.7% of scores have z-scores between −3 and 3

Spherical Geometry

Circumference of a circle

$$C = 2\pi r \quad \text{or} \quad C = \pi D$$

r is radius

D is diameter

Arc length of a circle

$$l = \frac{\theta}{360} 2\pi r$$

r is radius

θ is number of degrees in central angle

Radius of Earth

(taken as) 6400 km

Time differences

For calculation of time differences using longitude:

$15° = 1$ hour time difference

Area

Circle

$$A = \pi r^2$$

r is radius

Sector

$$A = \frac{\theta}{360} \pi r^2$$

r is radius

θ is number of degrees in central angle

Annulus

$$A = \pi \left(R^2 - r^2 \right)$$

R is radius of outer circle

r is radius of inner circle

Trapezium

$$A = \frac{h}{2} \left(a + b \right)$$

h is perpendicular height

a and b are the lengths of the parallel sides

Area of land and catchment areas

unit conversion: 1 ha $= 10\,000$ m^2

Surface Area

Sphere

$$A = 4\pi r^2$$

r is radius

Closed cylinder

$$A = 2\pi r^2 + 2\pi rh$$

r is radius

h is perpendicular height

Volume

Prism or cylinder

$$V = Ah$$

A is area of base

h is perpendicular height

Pyramid or cone

$$V = \frac{1}{3} Ah$$

A is area of base

h is perpendicular height

Volume and capacity

unit conversion: 1 m$^3 = 1000$ L

Approximation Using Simpson's Rule

Area

$$A \approx \frac{h}{3} \left(d_f + 4d_m + d_l \right)$$

h is distance between successive measurements

d_f is first measurement

d_m is middle measurement

d_l is last measurement

Volume

$$V \approx \frac{h}{3} \left\{ A_L + 4A_M + A_R \right\}$$

h is distance between successive measurements

A_L is area of left end

A_M is area of middle

A_R is area of right end

Trigonometric Ratios
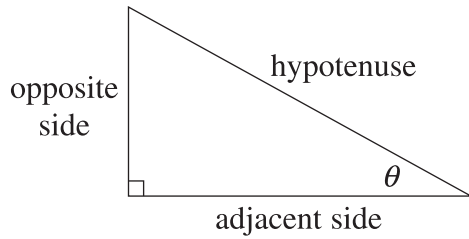
$$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}$$

$$\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$$

$$\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$$

Sine rule

In $\triangle ABC$,

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

Area of a triangle

In $\triangle ABC$,

$$A = \frac{1}{2}ab\sin C$$

Cosine rule

In $\triangle ABC$,

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

or

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

Units of Memory and File Size

$$1 \text{ byte} = 8 \text{ bits}$$

$$1 \text{ kilobyte} = 2^{10} \text{ bytes} = 1024 \text{ bytes}$$

$$1 \text{ megabyte} = 2^{20} \text{ bytes} = 1024 \text{ kilobytes}$$

$$1 \text{ gigabyte} = 2^{30} \text{ bytes} = 1024 \text{ megabytes}$$

$$1 \text{ terabyte} = 2^{40} \text{ bytes} = 1024 \text{ gigabytes}$$

Blood Alcohol Content Estimates

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

or

$$BAC_{\text{female}} = \frac{10N - 7.5H}{5.5M}$$

N is number of standard drinks consumed
H is number of hours of drinking
M is person's mass in kilograms

Distance, Speed and Time

$$D = ST, \quad S = \frac{D}{T}, \quad T = \frac{D}{S}$$

$$\text{average speed} = \frac{\text{total distance travelled}}{\text{total time taken}}$$

$$\text{stopping distance} = \left\{\begin{array}{c}\text{reaction-time}\\\text{distance}\end{array}\right\} + \left\{\begin{array}{c}\text{braking}\\\text{distance}\end{array}\right\}$$

Probability of an Event

The probability of an event where outcomes are equally likely is given by:

$$P(\text{event}) = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Straight Lines

Gradient

$$m = \frac{\text{vertical change in position}}{\text{horizontal change in position}}$$

Gradient–intercept form

$$y = mx + b$$

m is gradient
b is y-intercept

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