

Question 1

Work out

$$\frac{7.7}{3 + \sqrt{6.25}}$$

Answer [1]

Question 2

The height of Mont Blanc is 4810 m, correct to the nearest 10 m. What is its **least** possible height?

Answer m [1]

Question 3

- (a) One gigabyte is 1 000 000 000 bytes. A computer has a 12.6 gigabyte hard disk.
Write 12.6 gigabytes in bytes, giving your answer in standard form.

Answer (a)bytes [1]

- (b) A picosecond is 10^{-12} seconds. A computer takes 150 picoseconds to complete a task.
Write 150 picoseconds in seconds, giving your answer in standard form.

Answer (b).....s [1]

Question 4

Elena invests \$560 at 5.5% per annum simple interest.
Calculate the number of years it will take to earn \$123.20 interest.

Answer [2]

Question 5

In 1998 the same cycle cost 1600 French francs in Paris and £170 (pounds) in London.
One pound was equal to 9.30 French francs.
In which city did the cycle cost less and by how much?
Give your answer either in French francs or in pounds.

Answer City

Amount [2]

Question 6

An organisation spends 10% of its income on administration and uses the rest for charitable work.
In 1998 it used \$234 000 for charitable work.
Calculate its income in 1998.

Answer \$ [2]

Question 7

Three estimates for the volume of water in a bucket are given below.

9 litres, 7000 cm^3 and 0.0009 m^3 .

(a) Arrange these in order of size, starting with the smallest.

Answer (a) < < [2]

(b) The actual volume is 3 litres. Which estimate is the closest?

Answer (b) [1]

Question 8

Anne-Françoise took part in a charity walk.
She walked 43.4 km at an average speed of 2.8 km/h.

(a) For how long did she walk?

Answer (a)h [2]

(b) She started the walk at 20 40. At what time on the next day did she finish the walk?

Answer (b) [1]

Question 9

For a holiday in 1998, Stefan wanted to change 250 Cypriot pounds (£) into Greek Drachma.
He first had to pay a bank charge of $1\frac{1}{2}\%$ of the £250.
He then changed the remaining pounds into Drachma at a rate of £1 = 485 Drachma.
Calculate how many Drachma Stefan received, giving your answer to the nearest 10.

AnswerDrachma [3]

Question 10

Find the value of x , y and z when

(a) $3^x = 1$,

Answer (a) $x =$ [1]

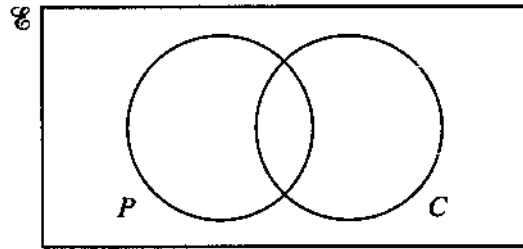
(b) $10^y = 0.01$,

Answer (b) $y =$ [1]

(c) $16^z = 2$.

Answer (c) $z =$ [1]

Question 11

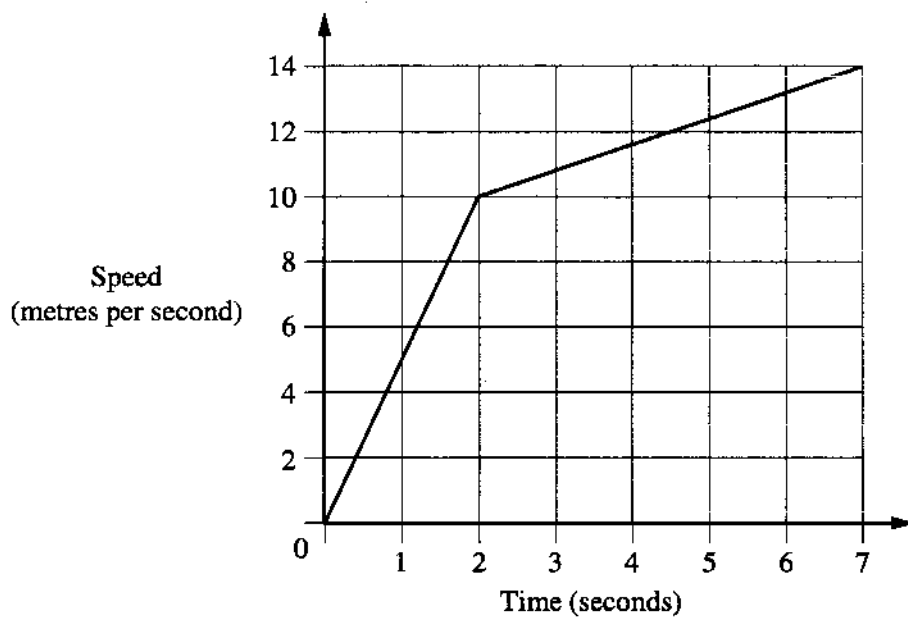


- (a) There are 22 students in a class.
15 of these students study Physics (P) and 17 study Chemistry (C).
3 study neither Physics nor Chemistry.
By using the Venn diagram, or otherwise, find the number of students who study both Physics and Chemistry.

Answer (a) [2]

- (b) On the Venn diagram shade the region $P' \cap C$. [1]

Question 12



A car starts from rest. The speed-time graph shows the first 7 seconds of its journey. Calculate

(a) the acceleration between 2 and 7 seconds,

Answer (a)m/s² [1]

(b) the distance travelled by the car during the first 7 seconds.

Answer (b)m [2]

Question 13

The brightness (B) of an object varies inversely as the square of the distance (d) of the object from a light.

When $d = 12$, $B = 2$.

(a) Find an equation connecting B and d .

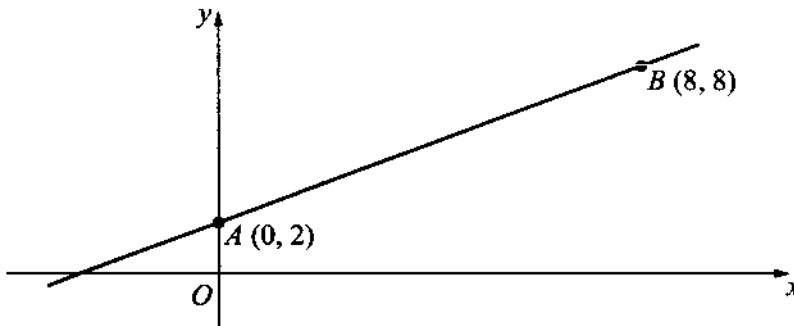
Answer (a) [2]

(b) Find the value of B when $d = 3$.

Answer (b) [1]

Question 14

The diagram, which is not drawn to scale, shows the graph of the function $y = mx + c$, which passes through the points $A (0, 2)$ and $B (8, 8)$.



(a) Find the value of m and the value of c .

Answer (a) $m =$

$c =$ [3]

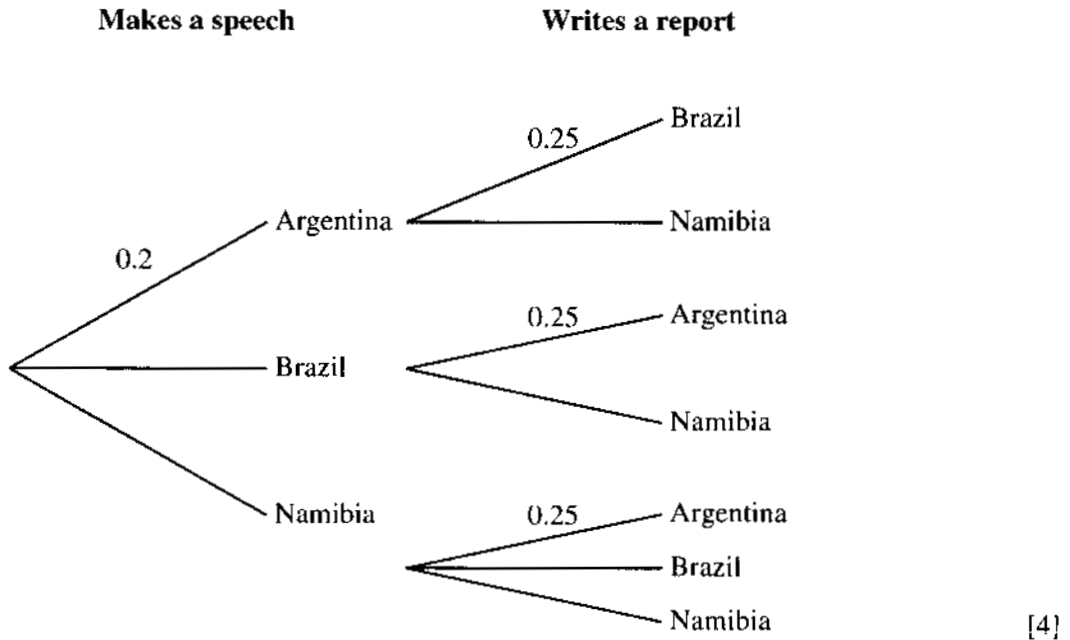
(b) Calculate the length of AB .

Answer (b) $AB =$ [2]

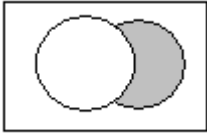
Question 15

One teacher from Argentina, one from Brazil and three from Namibia attend an international conference. One of these five teachers is chosen at random to make a speech, and one of the remaining four is chosen at random to write a report.

- (a) Copy and complete the probability tree diagram below, showing the countries from which the teachers were chosen.



- (b) Calculate the probability that
- (i) both the chosen teachers were from Namibia, [2]
 - (ii) neither of the chosen teachers was from Namibia, [3]
 - (iii) the teacher from Brazil was **not** chosen. [3]
- (c) One of the remaining three teachers is chosen at random to chair the conference. Calculate the probability that this is the teacher from Brazil. [2]

QUESTION	ANSWER	MARK	
1	1.4	1	
2	4805	1	
3 (a)	1.26×10^{10}	1	
(b)	1.5×10^{-10}	1	
4	4	2	(M1) for any correct numerical statement of simple interest
5	London £2.04 or Ff 19	2	(M1) for 170×9.03 or $1600 \div 9.3$ (SC1) for London and £2 (SC1) for Paris and £2.04 or Ff 19
6	260000	2	(M1) for $234000 \div 0.9$ or equivalent
7 (a)	0.0009, 7000, 9	2	(SC1) for order reversed
(b)	0.0009	1	Correct answer only
8 (a)	15.5	2	Allow 15h 30m (M1) for $43.4 \div 2.8$
(b)	1210	1	√ award (B1) for (a) + "2040"
9	119430	3	(M1) for finding 98.5% of 250 (M1) for "x 485" seen (SC2) for 11943(1.25)
10 (a)	0	1	Correct answer only
(b)	-2	1	Correct answer only
(c)	$\frac{1}{4}$	1	Correct answer only
11 (a)	13	2	(SC1) for one of $P' \cap C = 4$ or $P \cap C' = 2$
(b)		1	
12 (a)	0.8	1	
(b)	70	2	(M1) for attempting to find the correct area under curve
13 (a)	$B = \frac{288}{d^2}$ (or equivalent)	2	(M1) for $B = \frac{k}{d^2}$ or $k = 288$
(b)	32	1	Correct answer only
14 (a)	$m = \frac{3}{4}$ (or equivalent) $c = 2$	$\frac{2}{1}$	(M1) for a correct numerical gradient attempt seen
(b)	10	2	(M1) for $AB^2 = 6^2 + 8^2$

QUESTION	ANSWER	MARK		
15 (a)	Makes a speech			
	0.2	Brazil	1	
	0.6	Namibia	1	
	Writes a report			
	0.75	Namibia	1	Both answers correct
	0.75	Namibia		
	0.25	Brazil	1	Both answers correct
0.50	Namibia			
(b)(i)	0.3	2	✓ award (M1) for ('his' 0.6) x ('his' 0.5)	
(b)(ii)	0.1	3	(M1) for 0.2×0.25 seen (M2) for alternative method 0.4×0.25 seen ✓ award (M1) for $(0.2 \times 0.25) + (('his' 0.2) \times 0.25)$	
(b)(iii)	0.6	3	(M2) for 0.8×0.75 or $(0.2 \times 0.75) + (0.6 \times 0.25) + (0.6 \times 0.5)$ ✓ award (M2) for 'his' $P(A\&N) + P(N\&A) + P(N\&N)$ ✓ award (M1) for partially correct, e.g. 'his' $P(A\&N) + P(N\&A)$	
(c)	0.2	2	✓ award (M1) for (b)(iii) $\times \frac{1}{3}$	

TYPES OF MARK

Most of the marks (those without prefixes and 'B' marks) are given for accurate results, drawings or statements.

'M' marks are awarded for any correct method applied to the appropriate numbers.

'B' marks are given for a correct statement or step.

'A' marks are for accurate results or statements but are awarded only if the relevant 'M' marks have been earned.

'SC' marks are awarded in special cases.

The symbol '✓' indicates that a previous error is to be 'followed through' i.e. the mark can be gained if the candidate has made no further error in obtaining the relevant result.