

General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

1. (a) Given $3.58 - 2.734$

$$\begin{array}{r} 3.580 \\ - 2.734 \\ \hline 0.846 \end{array}$$

(b). Given 6.37×60

Step 1 : $6.37 \times 10 = 63.7$

$$\begin{array}{r} 63.7 \\ \times 6 \\ \hline 382.2 \\ \hline 24 \end{array}$$

(c). Given $13.8 \div 4$

$$\begin{array}{r} 3.35 \\ 4 \overline{)13.8} \end{array}$$

General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

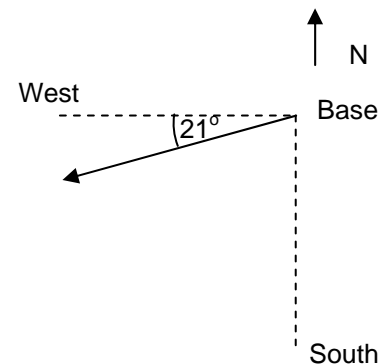
(d).

$$\frac{3}{4} + \frac{1}{16}$$

Step 1 : Make denominator (bottom) the same $\frac{12}{16} + \frac{1}{16}$

Step 2 : Add the numerators $\frac{12}{16} + \frac{1}{16} = \frac{13}{16}$

2. Given the diagram the tree figure bearing is:



$$270^\circ - 21^\circ = 249^\circ$$

3. Given there are 9 wooden ball in a bag numbered 1 to 9. The chance that a number is more than 7 is:

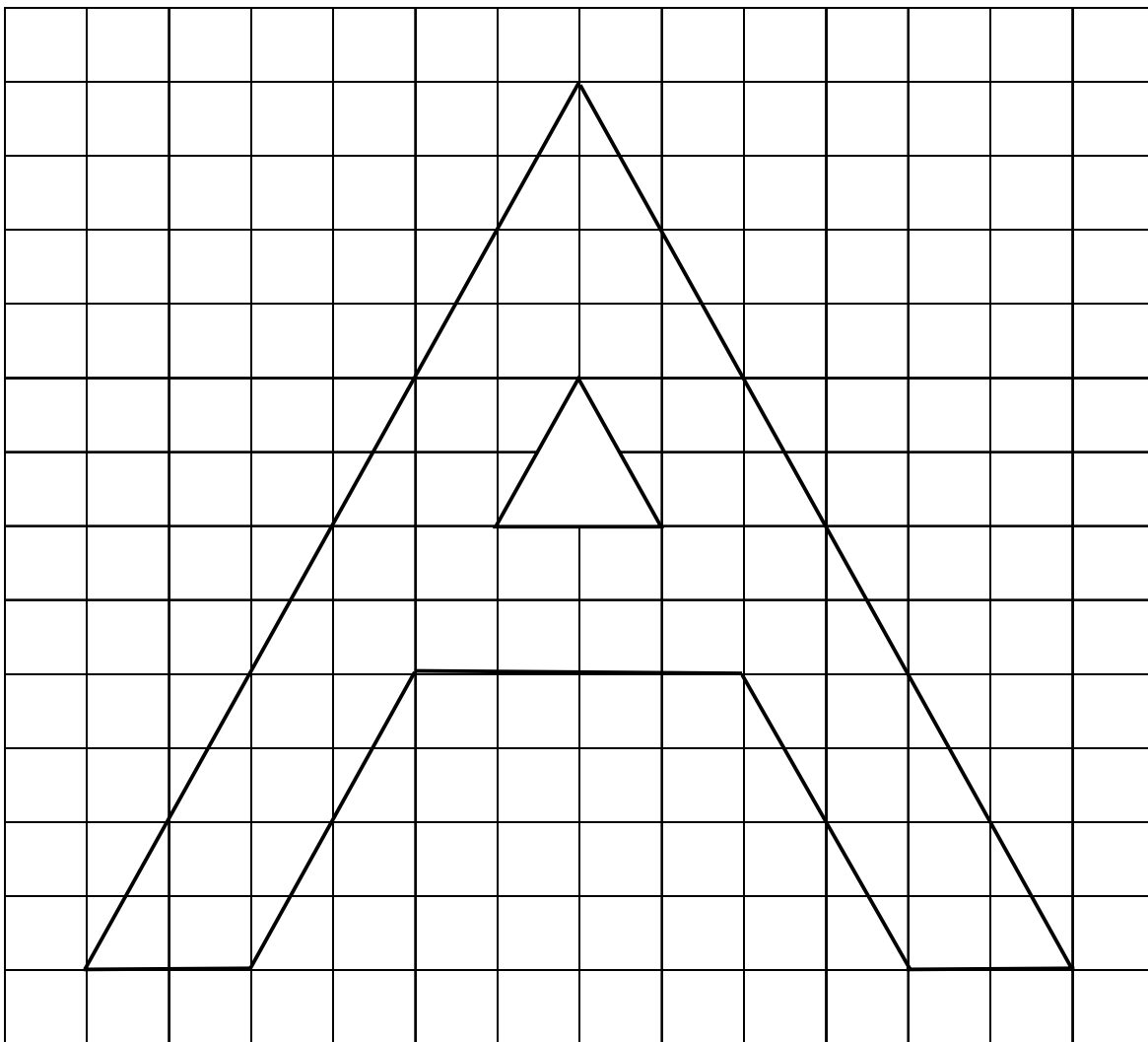
$$P(> 7) = \frac{\text{number over 7}}{\text{total number}} = \frac{2}{9}$$

General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

4. Given the ram of the letter A. Increasing it by a factor of 2 we get.

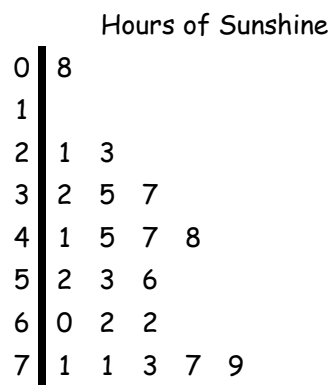


General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

5. Given the stem leaf diagram for the amount of sunshine each day in June:



$n = 21$ Key $3 \mid 2$ means 3.2 hours

- (a) The range is given by:

$$7.9 - 0.8 = 7.1$$

- (b) The median number of hours is:

Median is the middle number after data has been sorted 5.2 hours

General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

6. Given information on Pizza Restaurant bill the correct service charge is:

15% of £33

$$= 0.15 \times 33 = \text{£}4.95$$

$$\text{Total charge} = \text{£}33 + \text{£}4.95 = \text{£}37.95$$

Bill is wrong by £1

7. Given the rules for the True or false game.

True = +3 False = -1

- (a) Given Ann got 2 questions correct and 8 wrong her score is:

$$2 \times 3 - 8 = -2$$

- (b) Given David answered 10 questions and scored 18 points.
To work out how many questions he got right:

R	W	T
9	1	26
8	2	22
7	3	18
6	4	14
5	5	10
4	6	6
3	7	2

General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

8. Given the paper sizes information and looking at the pattern the sizes for A10 will be:

A3	297	x	420
A4	210	x	297
A5	148	x	210
A6	105	x	148
A7	74	x	105
A8	52	x	74
A9	37	x	52
A10	26	x	37

9. Given the planet Pluto is approximately 7364 million miles from the Sun.

In scientific notation the number is:

$$7\,364\,000\,000 = 7.364 \times 10^9$$

Remember scientific notation $a \times 10^n$ a must be between $1 < a < 10$
 n is an integer

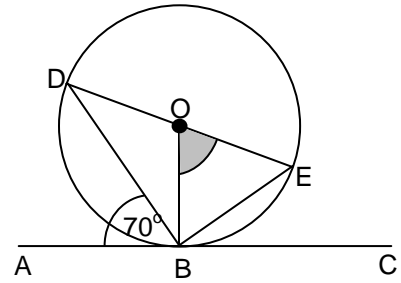
General Exam Paper 1 Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

10. Given

- Centre O
- AC is a tangent line to the circle at B
- Angle $DBA = 70^\circ$



Angle BOE is given by:

Since AC is a tangent to the circle, angle ABO is right-angled.

Angle DBO is $90^\circ - 70^\circ = 20^\circ$

ODB is an isosceles triangle so angle $ODB = 20^\circ$ and angle $BOD = 140^\circ$.

Finally, DOE is a straight line therefore angle BOE is:

$$180^\circ - 140^\circ = 40^\circ$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

1. Given the distance between Verona and Milan is 158 km and the time taken is 1 hours and 40 mins, then the average speed is :

$$40 \text{ mins in hours is } \frac{40}{60} = \frac{2}{3}$$

$$\text{average speed is } = \frac{158}{1\frac{2}{3}} = 98.8 \text{ km/hr}$$

2. Given Alice gets a basic rate of pay of £6.50, her overtime rate is time and a half and she got paid £136.50 last week which included 4 hours overtime. To calculate how much time she worked at normal rate we have:

$$\text{Overtime rate} = 1.5 \times 6.50 = \text{£}9.75$$

$$\text{Overtime pay} = 9.75 \times 4 = \text{£}39$$

$$\text{Basic pay} = \text{£}136.50 - \text{£}39 = \text{£}97.50$$

$$\text{Hours worked } \text{£}97.50 \div \text{£}6.50 = 15 \text{ hours}$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

- 3 Completing the table and finding the mean we have:

Number of letters	Frequency	Number of letter x frequency
1	5	$1 \times 5 = 5$
2	12	$2 \times 12 = 24$
3	18	$3 \times 18 = 54$
4	26	$4 \times 26 = 104$
5	18	$5 \times 18 = 90$
6	11	$6 \times 11 = 66$
7	7	$7 \times 7 = 49$
8	3	$8 \times 3 = 24$
Totals	100	396

$$\text{Mean} = \frac{396}{100} = 4.16$$

$$= 4.2 \text{ (to 1 decimal place)}$$

4. Given Book prices and Dyna must spend between £15 - £20 and does not buy more than one copy of any one book. All possible combinations are:

Book Title	Book Title	Book Title	Total Cost £
Pasta	Chicken		19.98
Pasta	Soups	Puddings	19.97
Chicken	Puddings		15.98
Chicken	Soups		16.98
Fish	Puddings		16.98
Fish	Soups		17.98

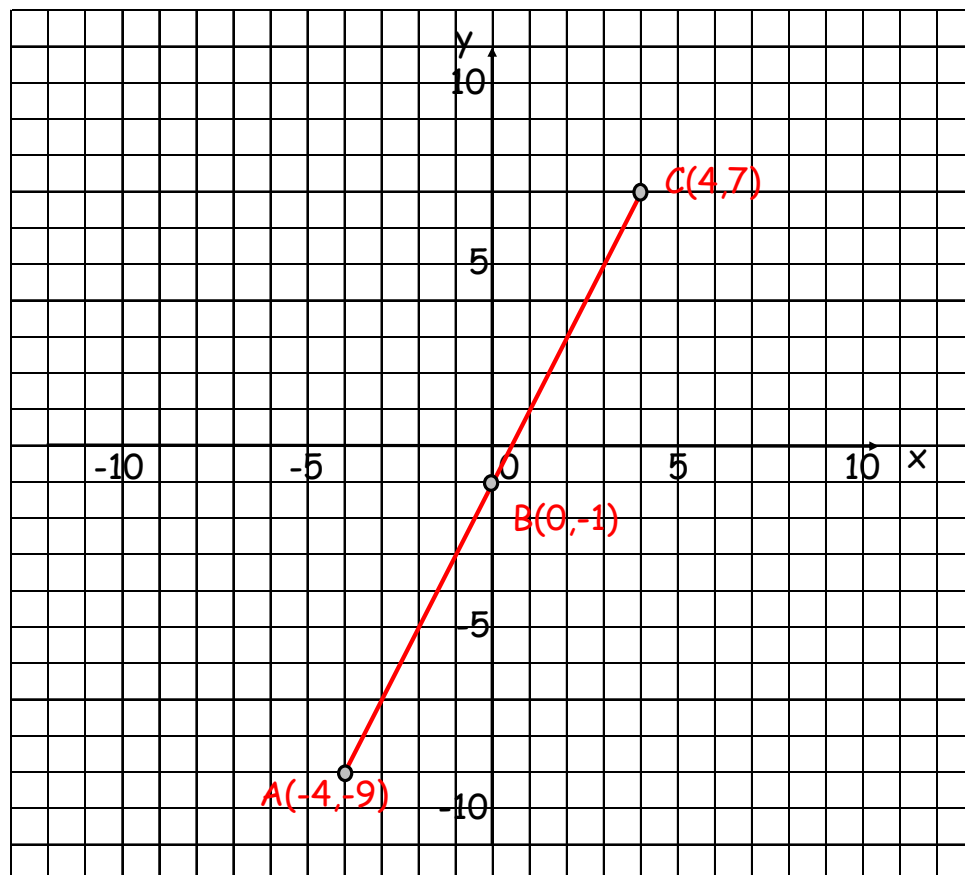
General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

5. Completing the table and drawing the line $y = 2x - 1$ we get.

x	-4	0	4
y	-9	-1	7



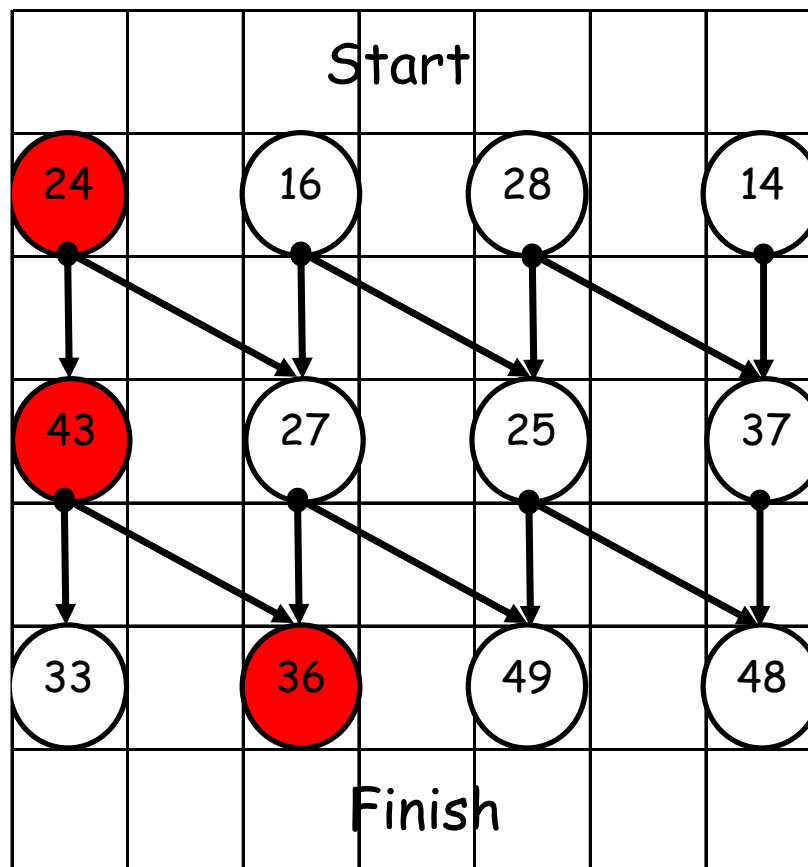
General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

6. Following the instructions:

- Start with a multiple of 4
- Move to a prime number
- Finish with a square number



First Number is 24

Second number is 43

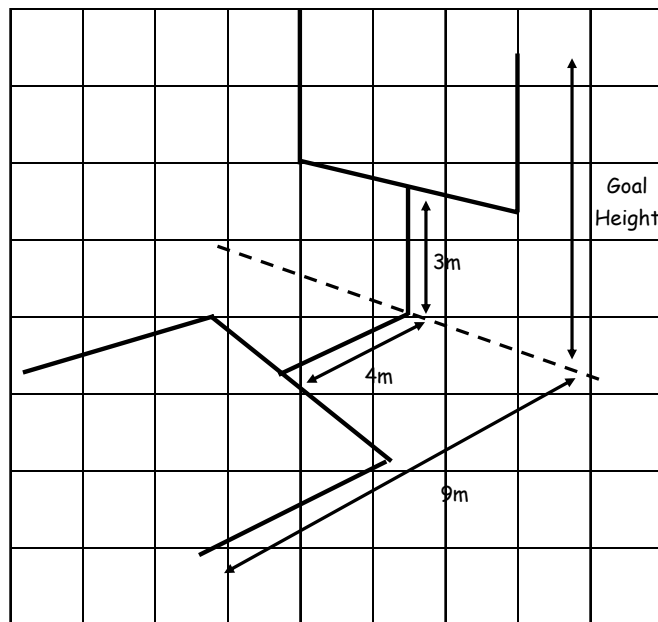
Third number 36

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

7. Given the diagram and measurements, the total goal height is:



Real : Shadow Scale

3 : 4

Real goal height is :

$$\frac{3}{4} \text{ of } 9 = 9 \div 4 \times 3 = 6.75\text{m}$$

General Paper 2 Exam Solutions 2003

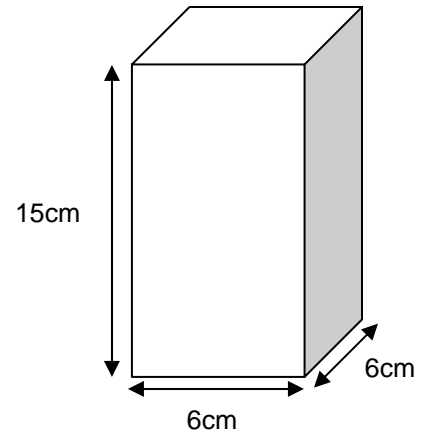
Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

8. Given the diagram and that the candle is a cuboid.
From a tub of 10 litre of wax we can make:

1 candle has volume:

$$\begin{aligned}\text{Volume} &= l \times b \times h \\ &= 6 \times 6 \times 15 \\ &= 540\text{cm}^3\end{aligned}$$



$$10 \text{ litres} = 10\,000\text{cm}^3$$

So for $10\,000\text{cm}^3$ we can get:

$$\frac{10\,000}{540} = 18.5 \quad \text{18 candles.}$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

9. (a) Multiplying out the brackets and collecting terms we get:

$$3(2w + 1) + 2(8 - w)$$

$$6w + 3 + 16 - 2w$$

$$4w + 19$$

- (b) Solving the inequality we get:

(Remember change side change sign)

$$3x - 4 \leq 11$$

$$3x \leq 11 + 4$$

$$3x \leq 15$$

$$x \leq \frac{15}{3}$$

$$x \leq 5$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

10. Given the cost C pounds of carpet varies directly as its length l m.

A carpet of length 5m costs £340:

- (a) A carpet of length 8m will cost:

$$c = k \times l$$

$$340 = k \times 5$$

$$k = \frac{340}{5} = 68$$

Formula is: $c = 68 \times l$

For 8m we have $c = 68 \times 8 = \text{£}544$

- (b) The length of the carpet that cost £238 will be:
He will be able to paint his desk:

$$c = 68 \times l$$

$$238 = 68 \times l$$

$$l = \frac{238}{68} = 3.5m$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

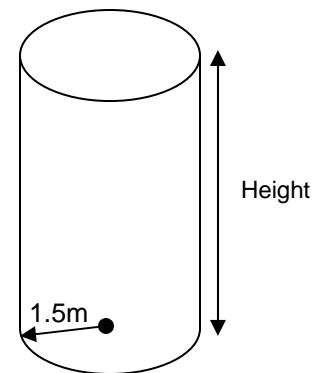
11. Given the climbing frame is cylindrical in shape, the surface area is 75.5m^2 and the radius 1.5m .

To find the height we have:

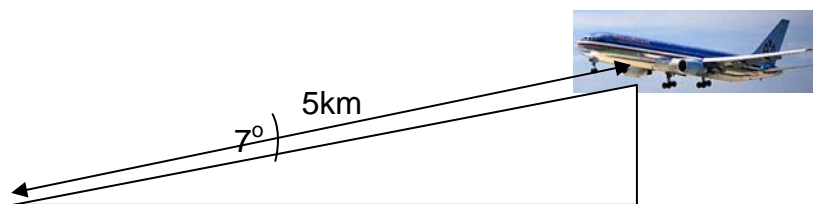
$$A = 2\pi \times r \times h$$

$$75.5 = 2\pi \times 1.5 \times h$$

$$h = \frac{75.5}{3\pi} = 8.01\text{m}$$



12. Given the diagram of the aircraft landing at Glasgow Airport we can calculate the height of the aircraft by:



By (S°H)(C^H)(T°A)

$$\sin(7^\circ) = \frac{x}{5}$$

$$x = 5\sin(7^\circ) = 0.6093\text{km} = 609\text{m}$$

General Paper 2 Exam Solutions 2003

Created by

Graduate Bsc (Hons) MathsSci (Open) GIMA

12. Given the diagram of the isosceles triangular banner hanging from a building and knowing the dimensions. We can calculate the area of the banner by:

$$\text{Area} = \frac{1}{2}bh \quad h = \text{vertical height}$$

By Pythagoras

$$\begin{aligned} h^2 &= \sqrt{(26^2 - 10^2)} \\ &= \sqrt{576} \\ &= 24\text{m} \end{aligned}$$

$$\text{Area} = \frac{1}{2} \times 10 \times 24$$

$$= 120\text{m}^2$$

