

General Paper 2 Exam Solutions 2006

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Graduate Bsc (Hons) MathsSci (Open) GIMA

1. Given the table of holiday options and that the holiday chosen is a mobile home on the 15th July for 12 days we have:

$$7 \text{ - Nights } \quad \pounds 825 \quad + \quad 5 \text{ - Nights @ } \pounds 72 \text{ per night}$$

$$\text{Total cost } \pounds 825 + \pounds 360 = \pounds 1185$$

2. Given the printer takes 7 minutes for 63 pages. Then in half an hour it can print:

$$7 \overline{)63} \quad 9 \text{ pages in a minute}$$

$$\Rightarrow 9 \times 30 = 270 \text{ pages in half an hour}$$

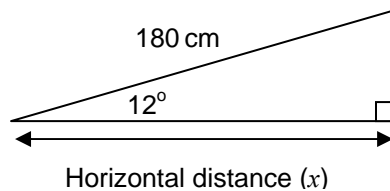
- 3a. Given that each person throws 6 darts, with centre scoring 5, middle ring 3, outer ring 2 and a miss 0. To win a prize we have to score 25 or greater. All possible combinations are:

Number of Darts scoring 5 pts	Number of Darts scoring 3 pts	Number of Darts scoring 2 pts	Number of Darts scoring 0 pts	Total Points
4	2	0	0	26
6	0	0	0	30
5	1	0	0	28
5	0	1	0	26
5	0	0	0	25

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4. Given the ramp diagram, we can draw the right-angled triangle below.



Using simple trig we can find the horizontal distance.

$$\cos(12^\circ) = \frac{x}{180}$$

$$\Rightarrow x = 180 \times \cos(12^\circ) = 176.1 \text{ cm (to 1 d.p.)}$$

5. Given Anne earns £5.60 per hour on weekdays and double time at the weekend. Also given she earned £436.80 last month and worked 54 hours on weekdays. Then she must have worked:

weekday rate → £5.60 weekend rate → £11.20

$$54 \times 5.60 = £302.40$$

Weekend pay :

£436.80

-£302.40

£134.40

Ann must have worked $134.40 \div 11.20 = 12$ hours

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6. (a) Factorising $6a + 15b$ we get:

$$3(2a + 5b)$$

- (b) Solving $4x - 3 = x + 21$ we get:

(Remember change side change sign)

$$4x - 3 = x + 21$$

$$4x - x = 21 + 3$$

$$3x = 24$$

$$x = \frac{24}{3} = 8$$

7. Given both Amy and Brian travel from Dundee to Stonehaven a distance 80km. The time difference, if it takes Amy 1hr 30mins by car and Brian takes the train which travels at an average of 60 km per hours is:

$$\text{Brian takes } \frac{80}{60} = 1\frac{1}{3} \text{ hrs}$$

$\frac{1}{3}$ of an hour is 20 mins so we have 1hr 20 mins

Time difference is 1hr 30m - 1hr 20m = 10mins

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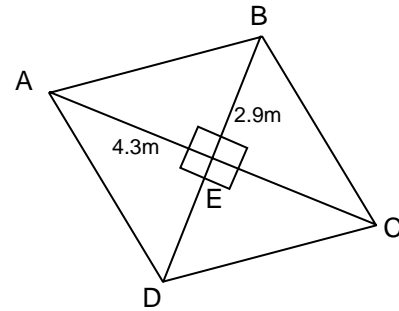
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8. Given the shape is a rhombus, all lengths are equal. By Pythagoras AB has length.

$$AB = \sqrt{(4.3)^2 + (2.9)^2}$$

$$= 5.2 \text{ m to (1 d.p)}$$



Therefore perimeter is $4 \times 5.2 = 20.8 \text{ m}$

9. (a) Given the diagram of the desk and that it is a quarter of a circle:

The area will be:

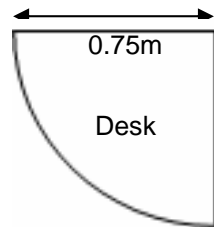
$$\text{Area} = \frac{1}{4} \times \pi \times r^2$$

$$\text{Area} = \frac{1}{4} \times \pi \times (0.75)^2$$

$$\text{Area} = \frac{1}{4} \times \pi \times \left(\frac{3}{4}\right)^2$$

$$\text{Area} = \frac{9\pi}{64} \text{ m}^2$$

$$\text{Area} = 0.44 \text{ m}^2$$



- (b) Since the paint he buys has coverage of 1 m^2 .
He will be able to paint his desk:

$$0.44 + 0.44 = 0.88 \text{ m}^2$$

Another 0.44 would be over 1 m^2

He can paint the desk twice.

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10. (a) Given Maria goes to nursery 3 full days and 2 half days. From the table her mother will have to pay:

$$3 \times £28 + 2 \times £15 = £84 + £30 = £114 \text{ each week}$$

- (b) Given the nursery introduces a new rate of £5 per hour and that on the full days Monday, Tuesday and Wednesday Maria is in from 9am - 3pm and on half days between 9 - 12 noon. Maria's mother will have to pay:

$$\text{Number of hours} = 3 \times 6 + 2 \times 3 = 24 \text{ hours}$$

$$\text{Total cost would be } 24 \times 5 = £120$$

Maria mother will be $£120 - £114 = £6$ worse off.

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11. Given the ship is on a bearing of 110° from Lossiemouth and 075° from Leuchers. The position of the ship in the North Sea is roughly given in the diagram below:



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12. Given the basic insurance premium is £765. Gordon get a fifth off because he is a new customer but has to pay 8% extra because he pays by monthly instalments. His total monthly payments will be:

Discount is

$$5 \overline{)765} \quad \rightarrow \text{£}765 - \text{£}153 = \text{£}612$$

Extra payment is

$$\frac{8}{100} \times \text{£}612 = \text{£}48.96$$

$$\text{Total cost is } \text{£}48.96 + \text{£}612 = \text{£}660.96$$

$$\text{Final Monthly payment is } \text{£}660.96 \div 12 = \text{£}55.08$$