IGCSE Edexcel Past Papers

MATHEMATICS B

Paper 2R

2015 — Winter 2019

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1 - (4MB0-S 2016-Paper 2R-Q4) - *NUMBER*

In February, a motor vehicle salesman sold 600 vehicles.
40% of these vehicles were vans.

(a) Find the number of vans sold in February.

(1)

All the other vehicles sold by the salesman in February were either lorries or cars.
The ratio of the number of lorries sold to the number of cars sold was 1 : 4

(b) Calculate the number of lorries sold and the number of cars sold in February.

(3)

In March, the salesman sold $\frac{1}{9}$ **more cars** than he sold in February but he sold $12\frac{1}{2}\%$ **fewer lorries** than he sold in February. He sold the same number of vans in March as he sold in February.

The salesman sold more vehicles in March than he sold in February.

(c) Express this increase as a percentage, to the nearest percent, of the total number of vehicles sold by the salesman in February.

(3)

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2 - (4MB0-W 2016-Paper 2R-Q1) - *NUMBER*

The time in Singapore is eight hours ahead of London so when it is 8 pm in Singapore, it is noon on the same day in London.

(a) When it is 10 am in London, write down the time in Singapore.

(1)

(b) When it is 3 am in Singapore, write down the time in London.

(1)

A plane leaves London at 2:35 pm (London time). It arrives in Singapore at 9:52 am the next day (Singapore time).

(c) Calculate the time, in hours and minutes, for the journey.

(2)

(Total for Question is 4 marks)

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3 - (4MB0-S 2017-Paper 2R-Q1) - *NUMBER*

Helen saves £P for her holidays.
She divides this money into three parts, £x, £y and £z, such that $x : y : z = 2 : 3 : 5$

Given that $x = 360$

(a) calculate the value of P.

(2)

Helen changes £y to euros and £z to dollars.
The exchange rates are £1 = 1.25 euros and 1 euro = 1.20 dollars.

(b) (i) Calculate the number of euros she should receive.

(ii) Calculate the number of dollars she should receive.

(5)

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4 - (4MB0-S 2017-Paper 2R-Q7) - *NUMBER, DIFFERENTIATION & KINEMATICS*

The entrance fee for a museum is 8 dollars.
One day the number of visitors to the museum was 250

(a) Calculate the total entrance fees paid for this day.

(1)

The entrance fee is increased from 8 dollars by 20%
The day after this increase the number of visitors to the museum decreased from 250 by 10%

(b) Calculate the total entrance fees paid on the day after the price increase.

(3)

The museum estimates that the number of visitors in a day will decrease from 250 by r%
when the entrance fee is increased from 8 dollars by $(2r)$%
After the entrance fee is increased from 8 dollars by $(2r)$%, the total entrance fees paid in a day is T dollars.

(c) Using the museum's estimate, show that

$$T = 2000 + 20r - 0.4r^2$$

(4)

(d) Find the value of r for which T is a maximum.
Show clear algebraic working.

(3)

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ANSWERS

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1 - (4MB0-S 2016-Paper 2R-Q4) - *NUMBER*

a	Vans = 240		1
b	One of Lorries: $\frac{1}{5}\times(600-"240")$ **OR** Cars: $\frac{4}{5}\times(600-"240")$ seen (oe)		3
		Lorries = 72 **OR** Cars = 288	
		Cars = $(600-"240")-"72"$ OR Lorries = $(600-"240")-"288"$	
c	Cars sold = "288" + $\frac{1}{9}\times"288"$ (= 320) (oe) **and** Lorries sold = $\frac{87.5}{100}\times"72"$ (= 63) (oe)		3
	% increase = $\frac{("320"+"63"+"240")-600}{600}\times100$ (oe) (3.833…)		

OR Increase in cars sold = $\frac{1}{9}\times"288"(=32)$ **and** (decrease) in lorries sold = $\frac{12.5}{100}\times"72"(=9)$	
$\frac{"32"-"9"}{600}\times100$	
	4%

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2 - (4MB0-W 2016-Paper 2R-Q1) - *NUMBER*

(a)		6pm (accept 18:00)
(b)		7pm (or 19:00) (previous day)
(c)	Either 2.35pm (London time) = 10:35pm (Singapore time) or 9:52am (Singapore time) = 1:52am (London time)	
		11 hours 17 mins

3 - (4MB0-S 2017-Paper 2R-Q1) - *NUMBER*

(a)	$\frac{360}{2}\times(2+3+5)$				M1	
			1800	2	A1	
(b) (i)	$(y=)\ \frac{3}{10}\times$"1800" (=540)	$(z=)\ \frac{5}{10}\times$"1800" (=900)			M1	Calculation for either y or z Not retrospective (ie only award in (b) if used in (b))
	"540"×1.25				M1	(DEP)
			675 euros		A1	
(ii)	"900"×1.25×1.2				M1	(DEP)
	(=1125x1.2)		1350 dollars	5	A1	

4 - (4MB0-S 2017-Paper 2R-Q7) - *NUMBER, DIFFERENTIATION & KINEMATICS*

(a)		2000 dollars	1	B1	
(b)	entrance fee = 1.2×8 (oe) (=9.6) visitors = 0.9×250 (oe) (=225)			M1	Complete method to find new entrance fee OR number of visitors.
	$1.2\times8\times0.9\times250$			M1 (DEP)	
		2160 dollars	3	A1	
(c)	entrance fee = $\frac{100+2r}{100}\times8$ $(=8+0.16r)$			M1 (INDEP)	Complete method to find new entrance fee.
	visitors = $\frac{100-r}{100}\times250$ (=250-2.5r)			M1 (INDEP)	Complete method to find new number of visitors.
	$(T=)\ \left(\frac{100+2r}{100}\times8\right)\left(\frac{100-r}{100}\times250\right)$ OR $(8+0.16r)(250-2.5r)$ OR $0.2(100+2r)(100-r)$			M1 (DEP)	
	$0.2(10000-100r+200r-2r^2)$	$2000+20r-0.4r^2$ (cso)	4	A1	dep on M marks **Expansion of brackets must be shown.**
(d)	$\frac{dT}{dr}=20-0.8r$	$-0.4(r^2-50r+5000)$ (ie rewriting)		M1	One term correct
	"$20-0.8r$"$=0$	$-0.4\left((r-25)^2+5000-625\right)$ ie completing the square		M1 (DEP)	Cand's derivative must be function of r
		25 (cao)	3	A1	

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