AQA – Further vectors – AS Further Mathematics P1

1. June/2020/Paper_1/No.13

Line l_1 has equation

$$\frac{x-2}{3} = \frac{1-2y}{4} = -z$$

and line l_2 has equation

$$\mathbf{r} = \begin{bmatrix} -7 \\ 4 \\ -2 \end{bmatrix} + \mu \begin{bmatrix} 12 \\ a+3 \\ 2b \end{bmatrix}$$

In the case when l_1 and l_2 are	parallel, show that	a = -11 and find th	e value [4

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(b)

(b)	In a $\mbox{\bf different}$ case, the lines l_1 and l_2 intersect at exactly one point, and the value of b is 3	ne
	Find the value of a.	[5 marks

2. June/2019/Paper_1/No.13

Line l_1 has Cartesian equation

$$x-3=\frac{2y+2}{3}=2-z$$

(a) Write the equation of line l_1 in the form

$$r = a + \lambda b$$

where λ is	а	parameter	and	а	and	b	are	vectors	to	be	found	

[2 marks]

- (b) Line l_2 passes through the points P(3, 2, 0) and Q(n, 5, n), where n is a constant.
- (b) (i) Show that the lines l_1 and l_2 are **not** perpendicular.

[3 marks]

(b) (ii)	Explain briefly why lines l_1 and l_2 cannot be parallel.	[2 marks
(b) (iii)	Given that θ is the acute angle between lines l_1 and l_2 , show that	
	$\cos\theta = \frac{p}{\sqrt{34n^2 + qn + 306}}$	
	where p and q are constants to be found.	[3 marks