**IB Math SL Year 2 VECTOR EQUATIONS OF LINES, PART 2**

**Unit 1, Day 4**

**1.** The points P(−2, 4), Q (3, 1) and R (1, 6) are shown in the diagram below.



(a) Find the vector .

(b) Find a vector equation for the line through R parallel to the line (PQ).

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 **(Total 6 marks)**

**2.** The line *L* passes through the points A (3, 2, 1) and B (1, 5, 3).

(a) Find the vector .

(b) Write down a vector equation of the line *L* in the form ***r*** = ***a*** + *t****b***.

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**(Total 6 marks)**

**3.** The vector equations of two lines are given below.

 ***r***1 =  + **, ***r***2 =  + *t*

 The lines intersect at the point P. Find the position vector of P.

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| --- | --- |
| *Working:* |  |
|  | *Answer*:.................................................................. |

**(Total 6 marks)**

**4.** The diagram below shows a line passing through the points (1, 3) and (6, 5).



 Find a vector equation for the line, giving your answer in the form

, where *t* is any real number.

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| *Working:* |  |
|  | *Answer:*....................................................................... |

**(Total 4 marks)**

**5.** A vector equation of a line is , *t*  .

 Find the equation of this line in the form *ax* + *by* = *c*, where *a, b*, and *c*  .

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| *Working:* |  |
|  | *Answer*:...................................................................... |

**(Total 6 marks)**

**6.** Car 1 moves in a straight line, starting at point A (0, 12). Its position *p* seconds after it starts is given by  = + *p**.*

(a) Find the position vector of the car after 2 seconds.

**(2)**

Car 2 moves in a straight line starting at point B (14, 0). Its position *q* seconds after it starts is given by  = + *q*.

Cars 1 and 2 collide at point P.

(b) (i) Find the value of *p* and the value of *q* when the collision occurs.

(ii) Find the coordinates of P.

**(6)**

**(Total 8 marks)**