

YEAR 1 | PURE MATHEMATICS | EXAM STYLE QUESTIONS 1

Question	1	2	3	4	5	6	7	8	9	Total
Marks										
Max Marks	3	4	3	7	3	4	15	6	11	56

1. Find the equation of the line through  $(0, -2)$  and  $(4, 18)$ . (3)

2. Solve the simultaneous equations

$$5x + 2y = 4$$

$$4x - 3y = 17$$

You **must** show your working.

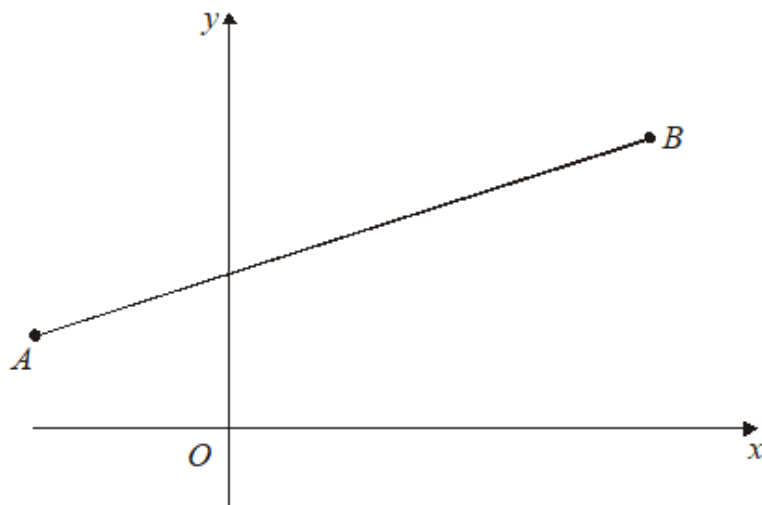
Do **not** use trial and improvement. (4)

3. A loft ladder makes an angle of  $74^\circ$  with the floor.  
The distance between the floor and the ceiling is  $2.6\text{m}$ .  
Calculate the length,  $L$ , of the loft ladder. (3)

4. (a) Make  $p$  the subject of the formula  $4(p + r) = 7r + 11$ . (3)

(b) Make  $x$  the subject of the formula  $y = \frac{m + x}{x - 2}$ . (4)

5. The diagram shows the points  $A(-2, 2)$  and  $B(8, 7)$ .



Find the equation of the line perpendicular to  $AB$  and passing through  $(0, 7)$ .

Give your answer in the form  $ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are integers. (3)

6. Solve the equation  $\frac{2}{y+1} + \frac{3}{2y-3} = 1$  (4)

7. The line  $l_1$  passes through the points  $P(-1,2)$  and  $Q(11,8)$ .

(a) Find an equation for  $l_1$  in the form  $y = mx + c$ , where  $m$  and  $c$  are constants. (4)

The line  $l_2$  passes through the point  $R(10,0)$  and is perpendicular to  $l_1$ . The lines  $l_1$  and  $l_2$  intersect at the point  $S$ .

(b) Calculate the coordinates of  $S$ . (5)

(c) Show that the length of  $RS$  is  $3\sqrt{5}$ . (2)

(d) Hence, or otherwise, find the exact area of triangle  $PQR$ . (4)

8. The line  $l$  has gradient  $-2$  and passes through the point  $A(3,5)$ .  $B$  is a point on the line  $l$  such that the distance  $AB$  is  $6\sqrt{5}$ . Find the coordinates of each of the possible coordinates of  $B$ . (6)

9. The points  $A$ ,  $B$  and  $C$  have coordinates  $(5,1)$ ,  $(p,7)$  and  $(8,2)$  respectively.

(a) Given that the distance between points  $A$  and  $B$  is twice the distance between points  $A$  and  $C$ , calculate the possible values of  $p$ . (7)

(b) Given also that the line passing through  $A$  and  $B$  has equation  $y = 3x - 14$ , find the coordinates of the mid-point of  $AB$ . (4)