

Topic: The Line in Book 2 (Topics 15 to 19)

<p>Q1. The line L: $3x - 2y + 7 = 0$ and the line M: $5x + y + 3 = 0$ intersect at the point p. Find the equation of the line through p that is perpendicular to M. Ans: $x - 5y + 11 = 0$</p>	<p>Q2. Find the equations of two lines through the origin that make an angle of 45° with the line $2x + 3y - 4 = 0$. Ans: $5x + y = 0$ and $x - 5y = 0$</p>
<p>Q3. Find the value of k ($k < 0$) if the distance from the point (3, k) to the line $3x - 4y + 7 = 0$ is 6 units. Ans: $k = -3.5$</p>	<p>Q4. Find the equations of the lines parallel to $12x - 5y + 3 = 0$, which are a distance of 2 units from the point (1, 2). Ans: $12x - 5y + 24 = 0$ and $12x - 5y - 28 = 0$</p>
<p>Q5. The line B contains the point (6, -2) and (-4, 10). The line A with equation $ax + 6y + 21 = 0$ is perpendicular to B. Find the value of a. Ans: $a = -5$</p>	<p>Q6. The point (-1, -5) is equidistant from the lines $3x - 4y - 2 = 0$ and $3x - 4y + k = 0$. Find k, where $k \neq -2$. Ans: -32</p>
<p>Q7. The line K passes through the point (-4, 6) and has slope m, where $m > 0$. The area of the triangle formed by K, the x-axis and the y-axis is 54 square units. Find m. Ans: $\frac{3}{4}$ or 3</p>	<p>Q8. Find the coordinates of the point that divides [ab] internally in the ratio 2:1 where a = (-1, 5) and b = (8, -1). Ans: (5, 1)</p> <p>Q9. Find the measure of the acute angle between $3x - y + 1 = 0$ and $x + 2y = 0$ to the nearest degree. Ans: 82°</p>
<p>Q10. The line K has positive slope and passes through p(2, -9). K intersects the x-axis at q and the y-axis at r and $pq : pr = 3:1$. Find the coordinates of q and r. Ans: $q=(8, 0)$ and $r=(0, -12)$</p>	<p>Q11. The equation of a mirror is $2x + 3y = 15$. A point P = (1, 0) lies in front of the mirror. The image of P in the mirror is the point Q. Find the coordinates of Q. Ans: (5, 6)</p>
<p>Q12. Find the orthocentre of the triangle with vertices (-1, 4), (6, 5) and (3, -4). Ans: (2, 3)</p>	<p>Q13. Find the circumcentre of the triangle with vertices (8, 3), (-3, 6) and (0, -9) and then find the radius of the circumcircle. Ans: (1, -1) and $\sqrt{65}$</p>
<p>Q14. The straight lines $y = k^2x + 12$ and $2ky = 4x + 5$ are perpendicular, $k \neq 0$. (i) Find the value of k (ii) Find the point of intersection of the two lines. Ans: (i) $k = -\frac{1}{2}$ (ii) (-4, 11)</p>	<p>Q15. p(-3, 1), q(1, 3), r(3, 0) and s(-1, -2) are the vertices of a parallelogram. Find the area of pqrs. Ans: 16</p> <p>Q16. Show that (-4, 5) is on a bisector of the angle between the two lines $3x + 4y + 17 = 0$ and $12x - 5y + 8 = 0$.</p>
<p>Q17. The vertices of a triangle are A(4, 2), B(-1, 7) and C(h, k). If the coordinates of the centroid of the triangle ABC are (2, 4), find the values of h and k. Ans: $h = 3$ and $k = 3$</p>	<p>Q18. If p(-6, 13) q(-1, 3) and r(3, -5) are 3 points, prove the points are collinear.</p> <p>Q19. (i) Show that p(k - 2, 7k - 7) is a point on the line m: $7x - y + 7 = 0$ (ii) Find the equation of the line n, on which the point q(t + 1, 3 - t) lies. Ans: $x + y - 4 = 0$</p>
<p>Q20. The distance from (5, 6) to (k, 2) is $2\sqrt{5}$. Find two possible values of k. Ans: 3, 7</p>	<p>Q22. The line $3x + 2y = c$ intersects the x-axis at p and the y-axis at q. If the area of triangle opq is 24 units², find the value of c. Ans: $12\sqrt{2}$</p>
<p>Q21. Find the equations of two lines which contain the point (4, 1) and are a distance of $2\sqrt{2}$ units from the point (1, 2). Ans: $7x + y - 29 = 0$ and $x - y - 3 = 0$</p>	