

Line and Circle Geometry Revision

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| (a) | (b) | (c) |
| <p>The points $A(6, -1)$ and $B(-4, 3)$ lie on the line l_1. Find the equation of l_1 in the form $ax + by + c = 0$.</p> <p style="text-align: center;">$2x + 5y - 7 = 0$</p> | <p>The equation of a circle is given by $(x - 3)^2 + (y + 1)^2 = 49$. Show that the point $(7, -6)$ lies inside the circle.</p> <p style="text-align: center;">Distance from centre $(3, -1)$ to $(7, -6)$ is $\sqrt{4^2 + 5^2} = \sqrt{41}$ which is less than the radius of the circle, 7.</p> | <p>Find the equation of the perpendicular bisector of the line segment joining $(1, -4)$ and $(-2, 11)$</p> <p style="text-align: center;">$x - 5y + 18 = 0$</p> |
| (d) | (e) | (f) |
| <p>Find the centre and radius of the circle with equation $x^2 + y^2 - 6x + 5y - 5 = 0$</p> <p style="text-align: center;">Centre $\left(3, -\frac{5}{2}\right)$ Radius $\frac{9}{2}$</p> | <p>The line with equation $x + y = a$ is a tangent to the circle with equation $x^2 - 4x + y^2 - 2y = 3$. Find the possible values of a.</p> <p style="text-align: center;">$a = 7$ or $a = -1$</p> | <p>$A(9, -2)$ and $B(5, -4)$ AB is the diameter of a circle. Find the equation of the circle in the form $x^2 + y^2 + ax + by + c = 0$</p> <p style="text-align: center;">$x^2 + y^2 - 14x + 6y + 53 = 0$</p> |
| (g) | | (h) |
| <p>The line l_1 with equation $y = 2x + 1$ meets the y-axis at point A. The line l_2, which is perpendicular to l_1, passes through point $B(2, 5)$ and meets the y-axis at point C. Find the area of triangle ABC.</p> <p style="text-align: center;">$A(0, 1)$ and $C(0, 6)$ Area = 5 square units</p> | | <p>A circle C has equation $x^2 + 2bx + y^2 - 4y - 10 = 0$. Given that the line $2x + y = 6$ intersects C at two distinct points, find the range of possible values for b.</p> <p style="text-align: center;">$b > 8 + \sqrt{10}$ or $b < 8 - \sqrt{10}$</p> |