

Coordinate Geometry Revision Questions

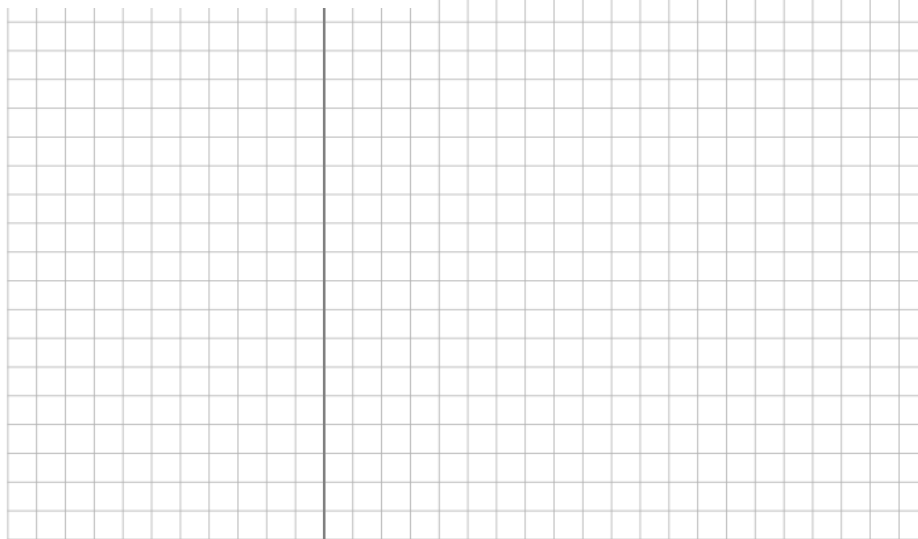


LC HL Project Maths

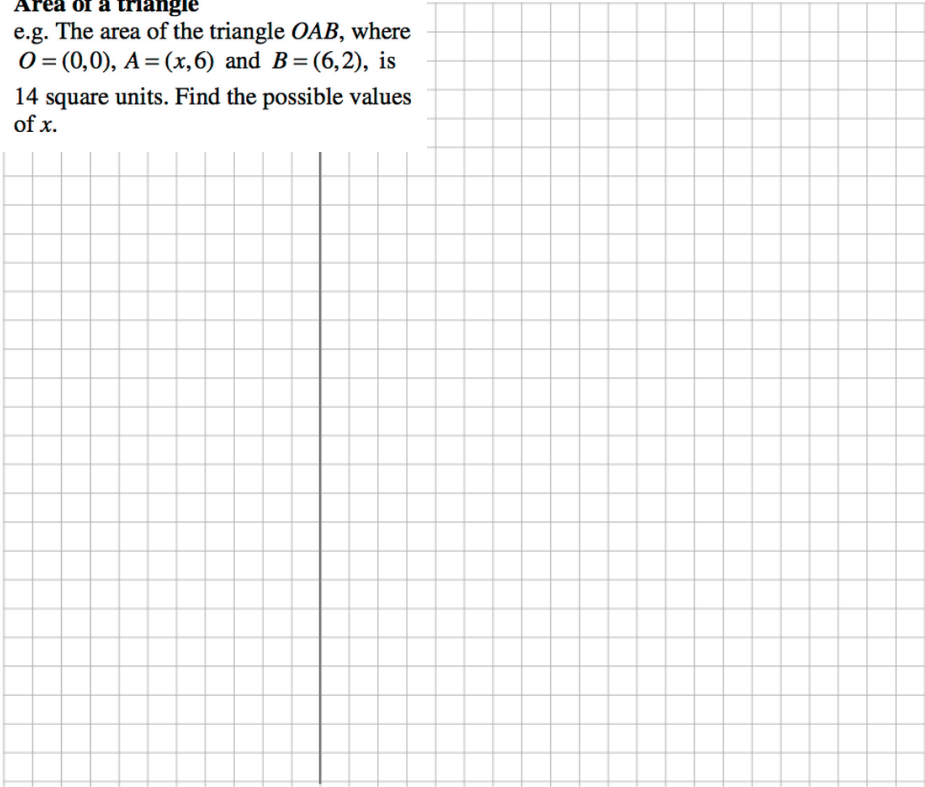
A. The Line

1. Basic concepts

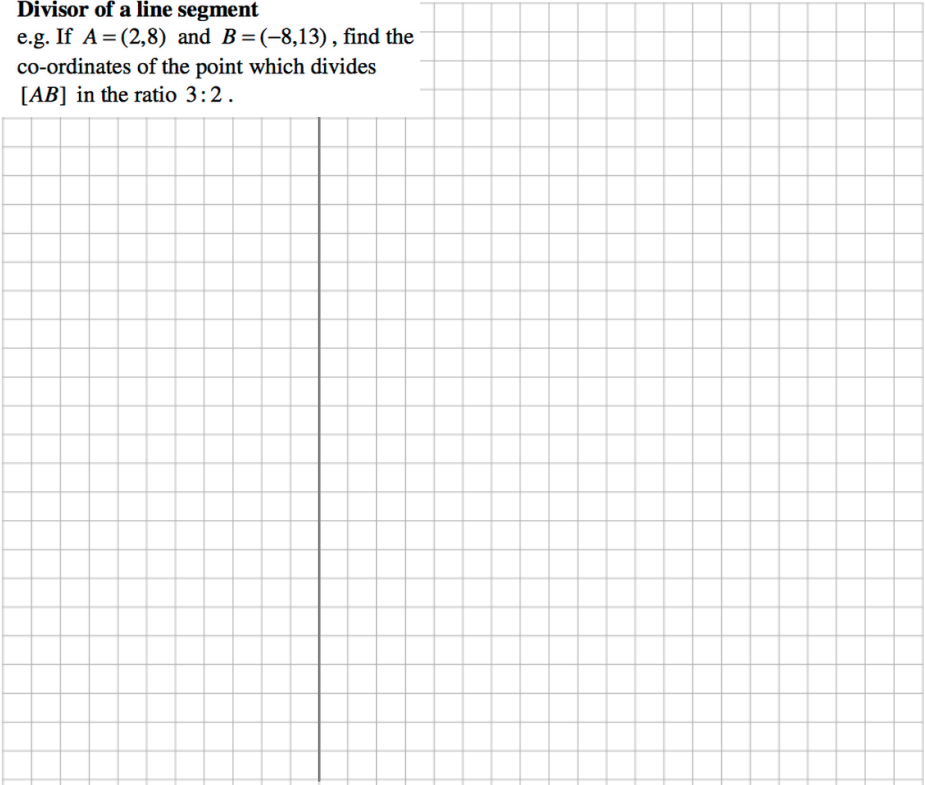
e.g. $A(2,3)$ and $B(5,9)$ are two of the vertices of the parallelogram $ABCD$, and the diagonals of the parallelogram intersect at $P(6,7)$. Find the co-ordinates of C and D .



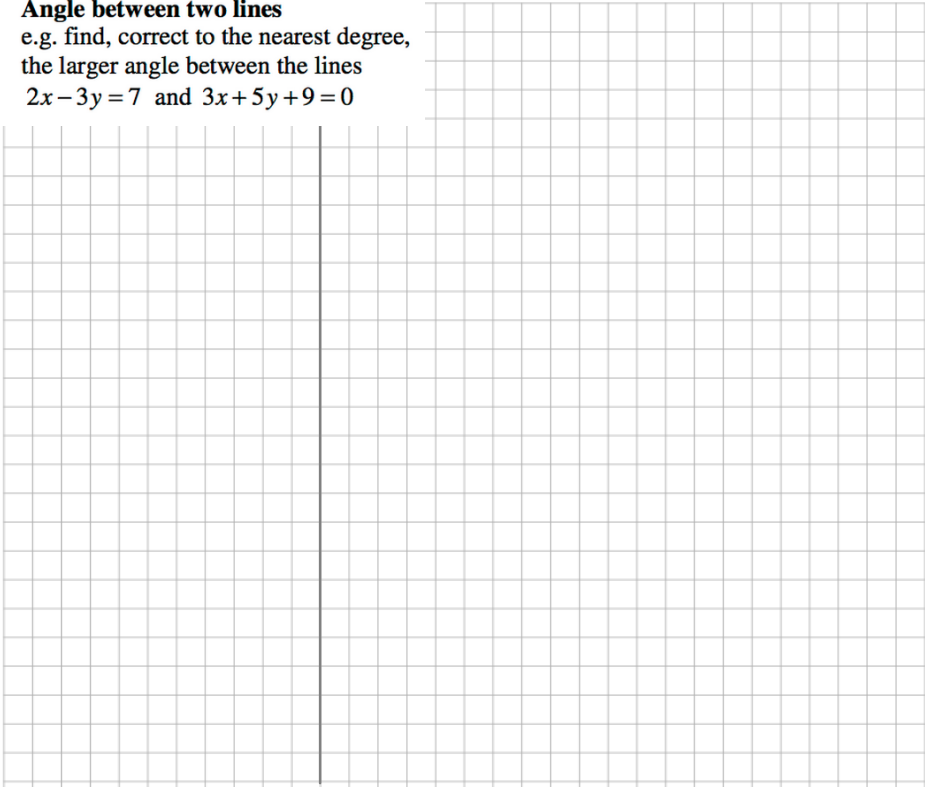
2. **Area of a triangle**
e.g. The area of the triangle OAB , where $O = (0,0)$, $A = (x,6)$ and $B = (6,2)$, is 14 square units. Find the possible values of x .



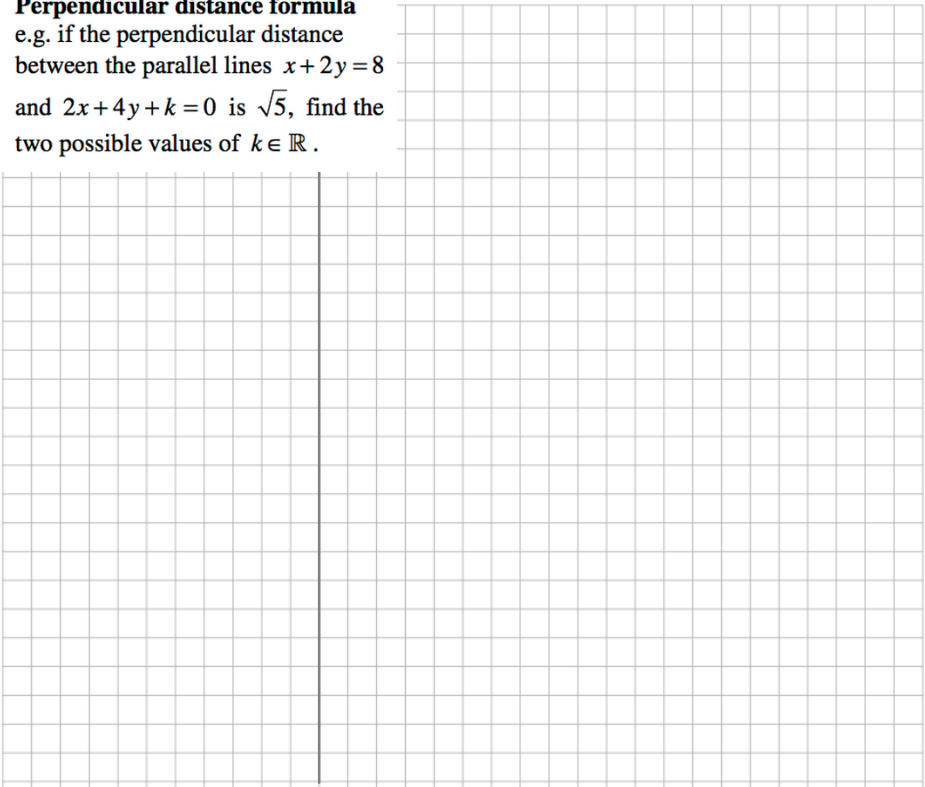
3. **Divisor of a line segment**
e.g. If $A = (2,8)$ and $B = (-8,13)$, find the co-ordinates of the point which divides $[AB]$ in the ratio $3:2$.



4. **Angle between two lines**
e.g. find, correct to the nearest degree,
the larger angle between the lines
 $2x - 3y = 7$ and $3x + 5y + 9 = 0$

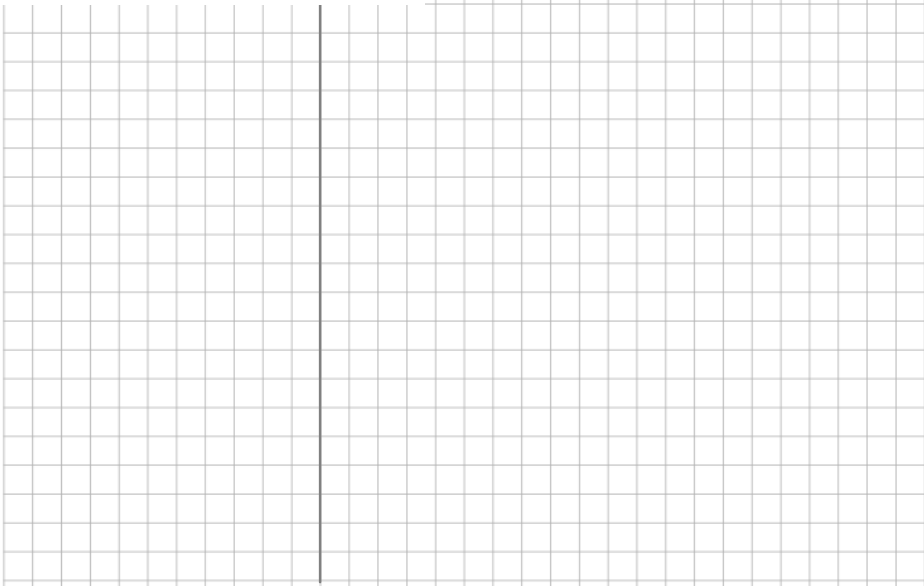


5. **Perpendicular distance formula**
e.g. if the perpendicular distance
between the parallel lines $x + 2y = 8$
and $2x + 4y + k = 0$ is $\sqrt{5}$, find the
two possible values of $k \in \mathbb{R}$.

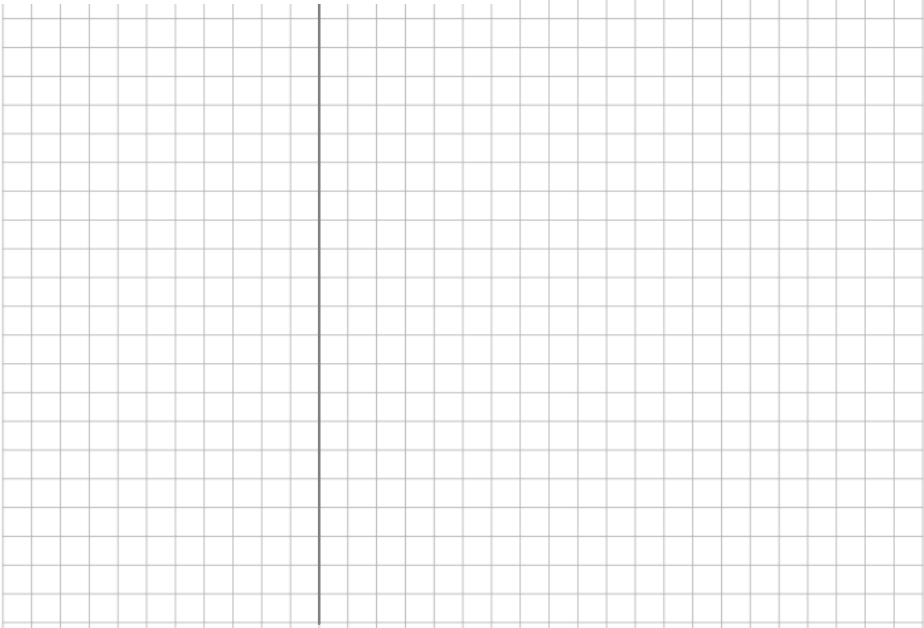


B. The Circle

1. **Equation:** $x^2 + y^2 = r^2$
e.g. find the equation of the circle, with
centre (0,0) and which has the line
 $x - 2y = 15$ as a tangent



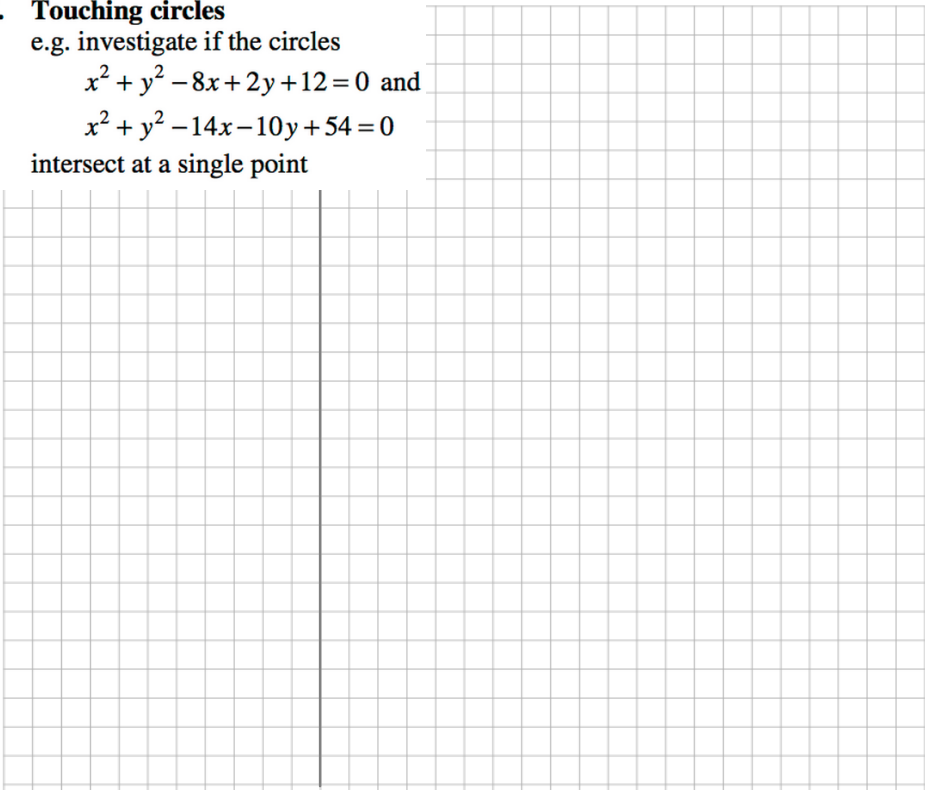
2. **Equation:** $(x - h)^2 + (y - k)^2 = r^2$
e.g. find the equation of the circle that
has centre (-1,3) and has the line
 $4x + y = 16$ as a tangent



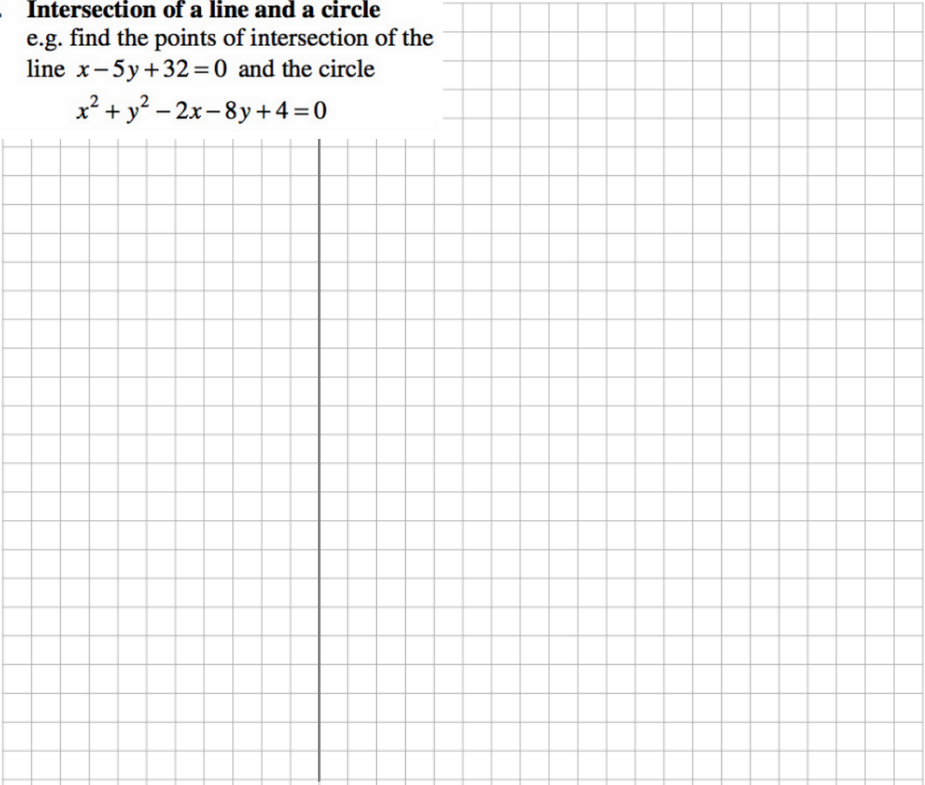
3. **Equation:** $x^2 + y^2 + 2gx + 2fy + c = 0$
e.g. the length of the radius of the circle
 $x^2 + y^2 - 2x + 2ky - 15 = 0$
is 5; find the value of $k > 0$ and the co-ordinates of the centre

4. **g, f, c method**
e.g. find the equation of the circle
which contains the points $(7,5)$ and
 $(8,-2)$ if the line $2x - y - 2 = 0$
contains a chord of length $4\sqrt{5}$ of
the circle

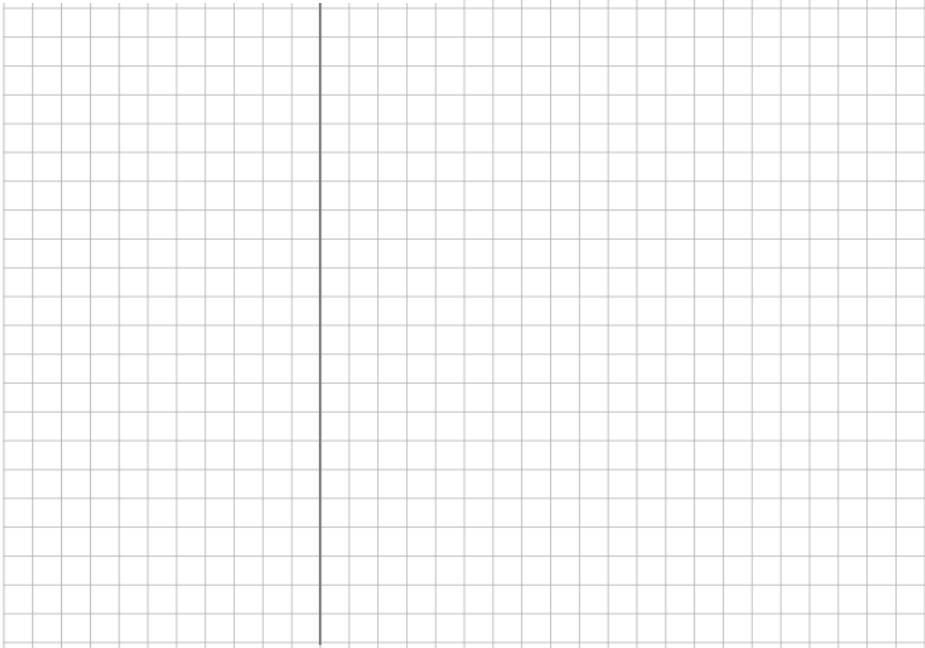
5. **Touching circles**
e.g. investigate if the circles
 $x^2 + y^2 - 8x + 2y + 12 = 0$ and
 $x^2 + y^2 - 14x - 10y + 54 = 0$
intersect at a single point



6. **Intersection of a line and a circle**
e.g. find the points of intersection of the
line $x - 5y + 32 = 0$ and the circle
 $x^2 + y^2 - 2x - 8y + 4 = 0$



7. **Tangent at a point**
e.g. find the equation of the tangent to
the circle $x^2 + y^2 + 4x - 2y - 20 = 0$ at
the point $(2,4)$



8. **Tangents and chords**
e.g. find the equations of the tangents
that can be drawn from the point
 $(0,-9)$ to the circle
 $x^2 + y^2 + 2x - 8y + 7 = 0$.

