Risp 9: Teacher Notes

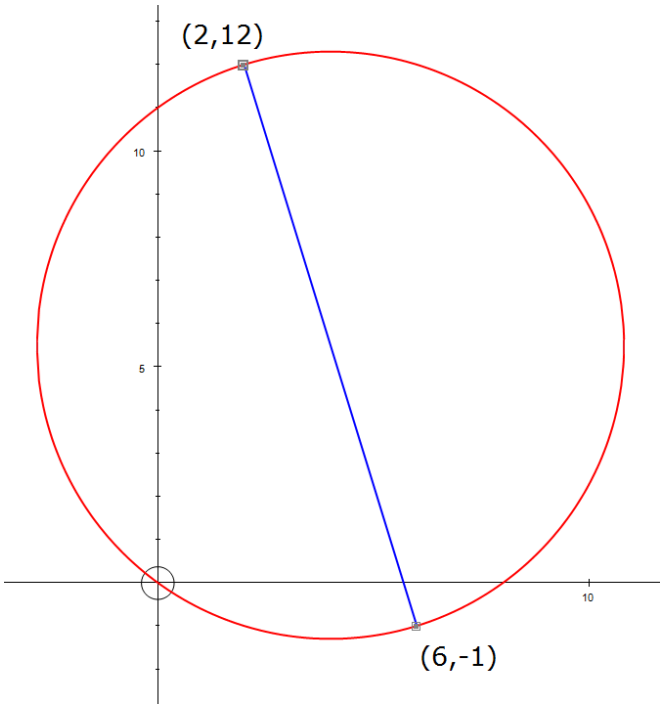
Suggested use: to consolidate/revise ideas of circles in coordinate geometry

Skills included: co-ordinate geometry: the equation of a circle
the midpoint of two points and the distance between two points

This activity is a good example of how risp-creation might take place. Suppose you have covered circles in co-ordinate geometry, and you would like to consolidate the work. You look for a question: how about, what is the equation of the circle with A = (p, s) and B = (q, r) as end points on a diameter? To answer this, we need to find the midpoint of AB (a handy bit of revision), and then the distance from here to either A or B to get the radius (again a vital skill). Now we can construct the equation of the circle (more good practice), which finally simplifies to:

$$x^2 + y^2 - (p + q)x - (r + s)y + pq + rs = 0.$$

So now it might occur to us that if we choose pq = -rs, the circle will go through the origin. Can we use this fact at the start of the activity, rather in the manner of a magician picking numbers? Now we have a risp. By turning the question around ('rispifying' it), we ask our students to practice the same skills that we did in its construction, but this time with something to discover.



When I tried this with my students, they enjoyed the sense of purpose the activity has. However, they were (surprisingly) slow to spot what made their circles special, which led to my advice about comparing with others. They also became confused with my notation: initially I used (a, b) and (c, d) as diameter end-points, which became mixed up with the centre (a, b) in the standard formula for the equation of a circle. The stronger students did begin to experiment with algebra and the general case. When I presented this to my group, I felt it would be too much to go through this generality with everyone, although the work does simplify nicely – if your group has a liking for algebra, however, then why not risk it?