

Circles 2

Overview

This activity requires students to use basic circle properties plus some skills from other topic areas such as completing the square. Students should be allowed to explore the activity for themselves as part of their learning experience rather than teaching the topic then using the exercise as consolidation. Much can be gained by allowing students time to rearrange equations into the appropriate form.

Method

Working in pairs, students cut out the statements and stick them onto a large sheet of paper. Students then decide whether each statement is true or false. Students are required to give justification for their decision next to each statement.

Students should choose in which order to tackle the statements allowing less confident students to start with the more straightforward statements. Teachers can add more demanding examples to challenge higher achieving students.

All working out should be shown on the paper and felt tips are useful when working in pairs to make all working visible. Crossings out are fine - encourage 'have a go and see what happens' rather than writing up something that is beautifully neat and correct.

The centre of the circle $(x + 3)^2 + (y - 4)^2 = 6$ is $(3, -4)$.

The radius of the circle $(x - 2)^2 + (y - 1)^2 = 10$ is 10.

The translation from $x^2 + y^2 = 5$ to $(x - 2)^2 + (y + 4)^2 = 5$ is $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$.

The point $(3, 2)$ lies on the circle $x^2 + y^2 + 3x + 4y = 30$.

The centre of the circle $x^2 + y^2 + 8x - 6y = 4$ is $(-4, 3)$.

The radius of the circle $x^2 + y^2 + 4x = 21$ is 5.

The translation from $(x + 7)^2 + (y - 5)^2 = 8$ to $x^2 + y^2 = 8$ is $\begin{pmatrix} 7 \\ -5 \end{pmatrix}$.

The circle $(x - 3)^2 + (y - 7)^2 = 25$ intersects the y axis twice.

The equation of the circle with diameter AB where A is the point $(1, 2)$ and B is the point $(7, 10)$ is $(x - 4)^2 + (y - 6)^2 = 100$.

$x^2 + y^2 + 8x + 6y + 40 = 0$ is a circle centre $(-4, -3)$.

The point $(7, 4)$ is inside the circle $(x - 5)^2 + (y - 3)^2 = 3$.