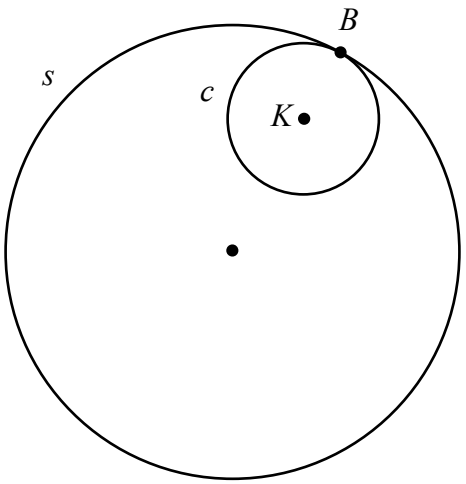
**Question 4** **(25 marks)**

Two circles $s$ and $c$ touch internally at $B$, as shown.




**(a)** The equation of the circle $s$ is $(x-1)^2+(y+6)^2=360$.

Write down the co-ordinates of the centre of $s$.

Centre:_____

Write down the radius of $s$ in the form $a\sqrt{10}$, where $a \in \mathbb{N}$.

Radius:_____

**(b)** **(i)** The point $K$ is the centre of circle $c$.
The radius of $c$ is one-third the radius of $s$.
The co-ordinates of $B$ are (7, 12).
Find the co-ordinates of $K$.

**(ii)** Find the equation of $c$.

**(c)** Find the equation of the common tangent at $B$.
Give your answer in the form $ax+by+c=0$, where $a, b, c \in \mathbb{Z}$.