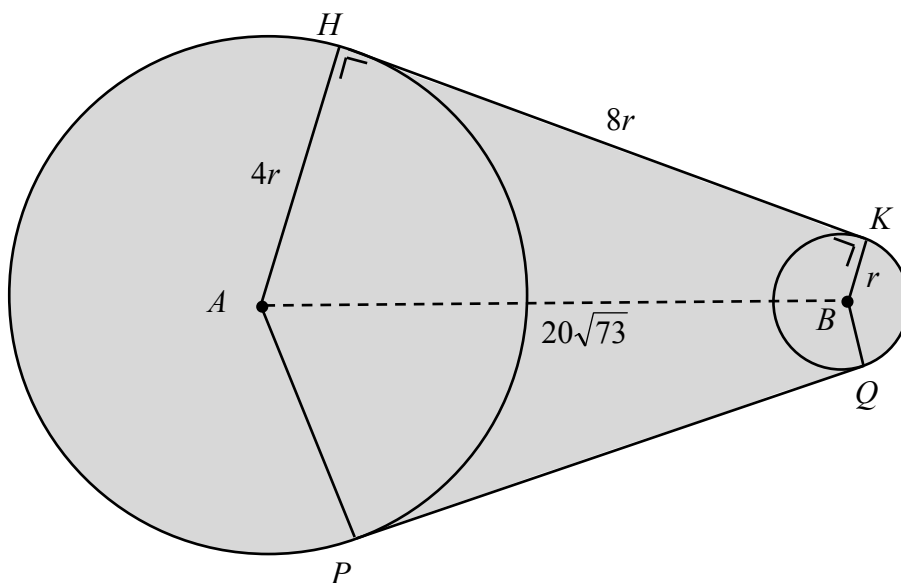## Question 7 (40 marks)

A flat machine part consists of two circular ends attached to a plate, as shown (diagram not to scale).
The sides of the plate, *HK* and *PQ*, are tangential to each circle.
The larger circle has centre *A* and radius 4*r* cm.
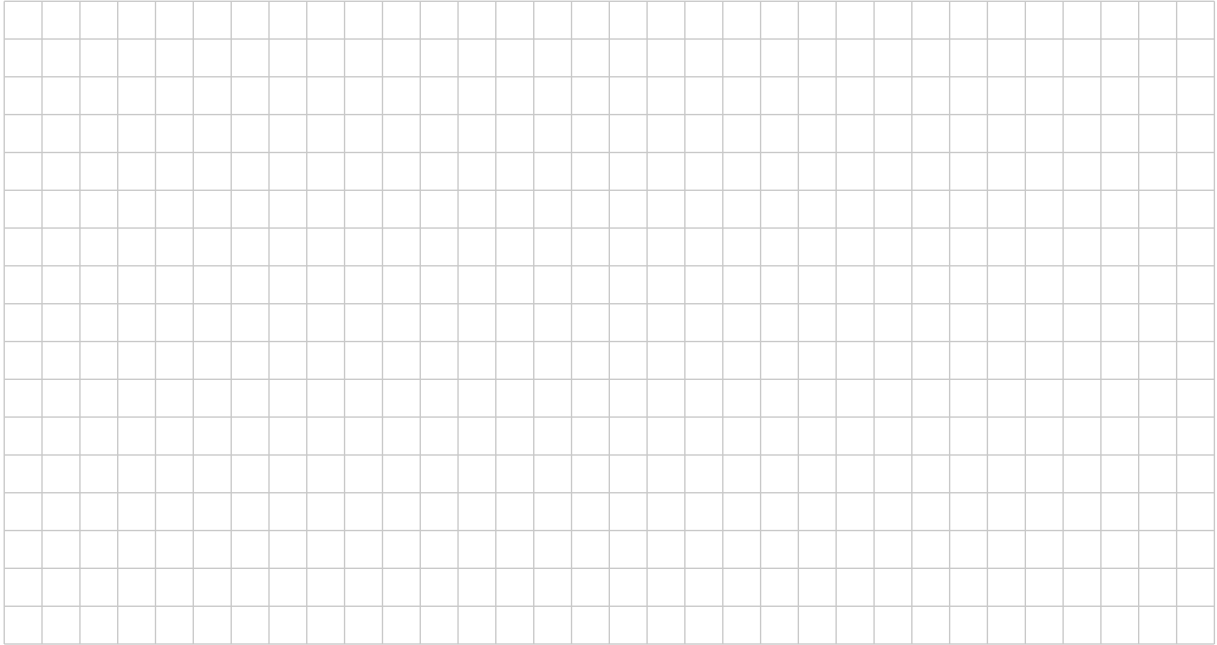The smaller circle has centre *B* and radius *r* cm.
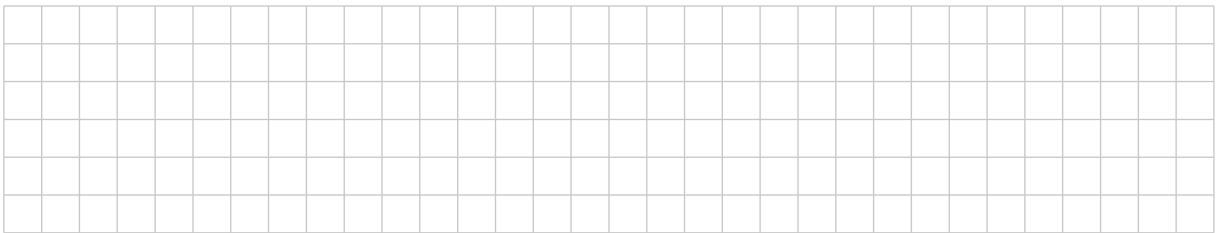The length of [*HK*] is 8*r* cm and $|AB| = 20\sqrt{73}$ cm.

(a) Find *r*, the radius of the smaller circle. (Hint: Draw $BT \parallel KH$, $T \in AH$.)
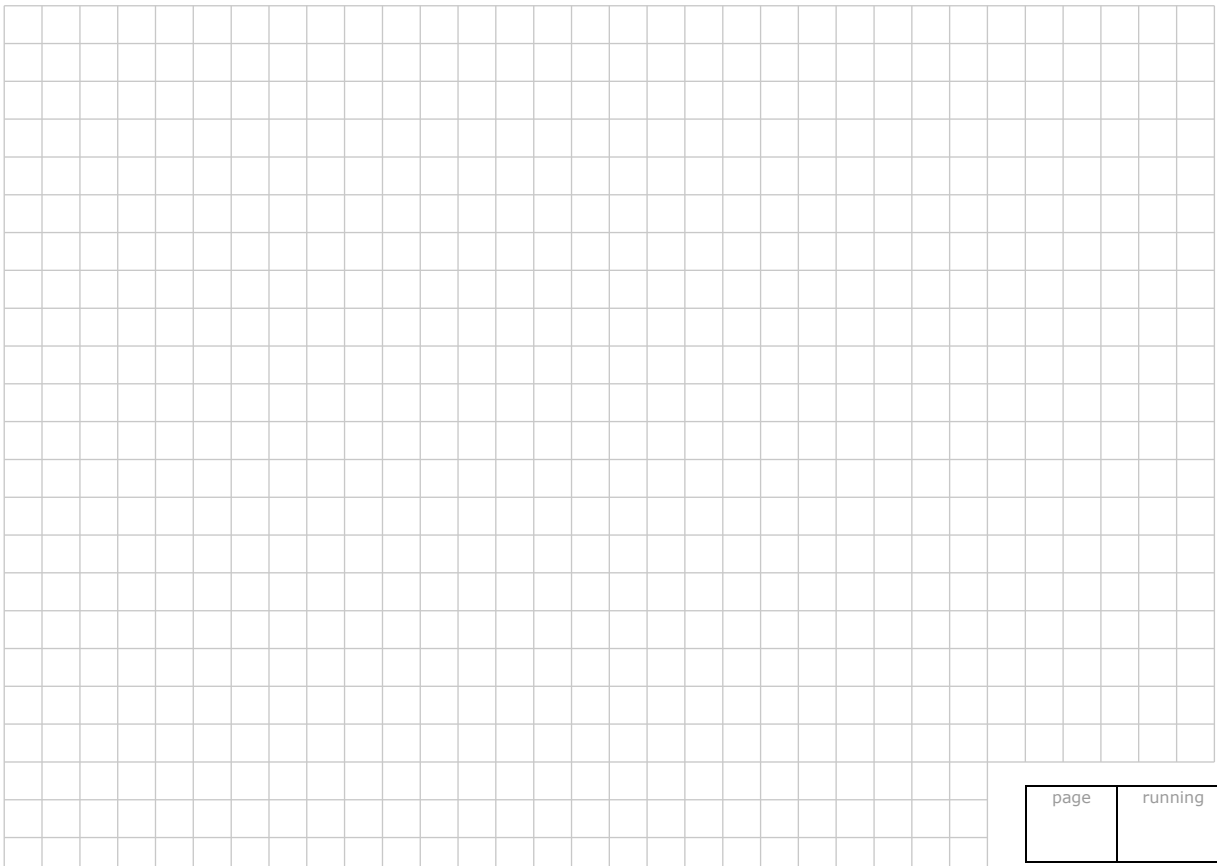
(b) Find the area of the quadrilateral *ABKH*.

(c) **(i)** Find $|\angle HAP|$, in degrees, correct to one decimal place.

(ii) Find the area of the machine part, correct to the nearest cm^2.

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