Question 9   **(55 marks)**
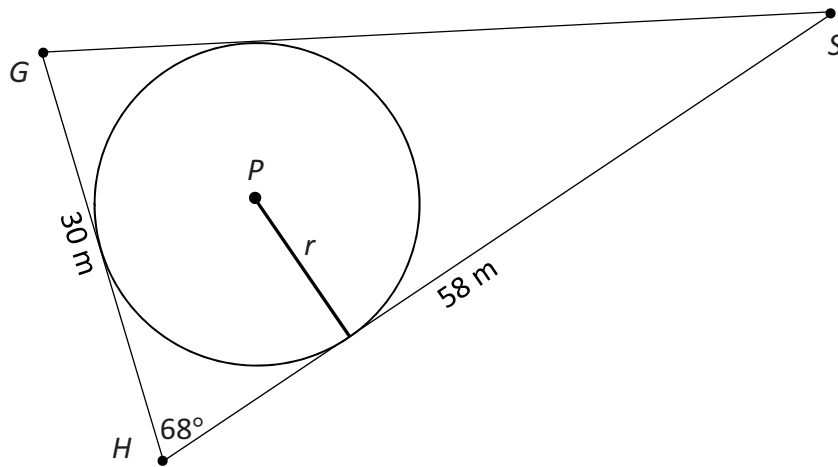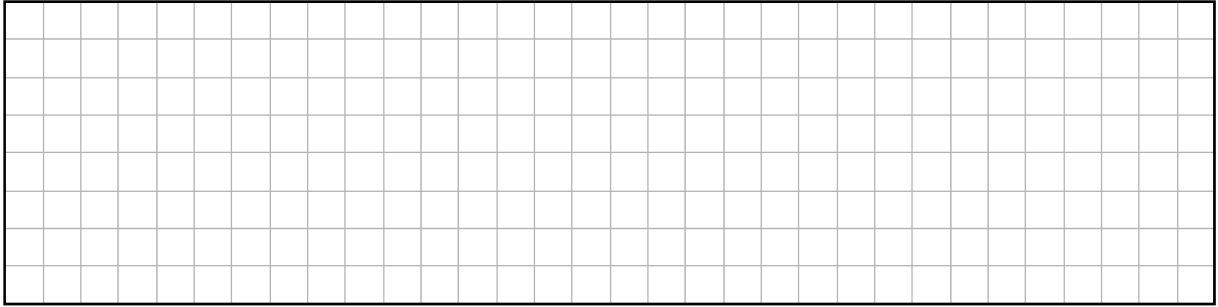
The diagram below shows a triangular patch of ground ΔSGH, with $|SH| = 58$ m, $|GH| = 30$ m, and $|\angle GHS| = 68°$. The circle is a helicopter pad. It is the incircle of ΔSGH and has centre P.
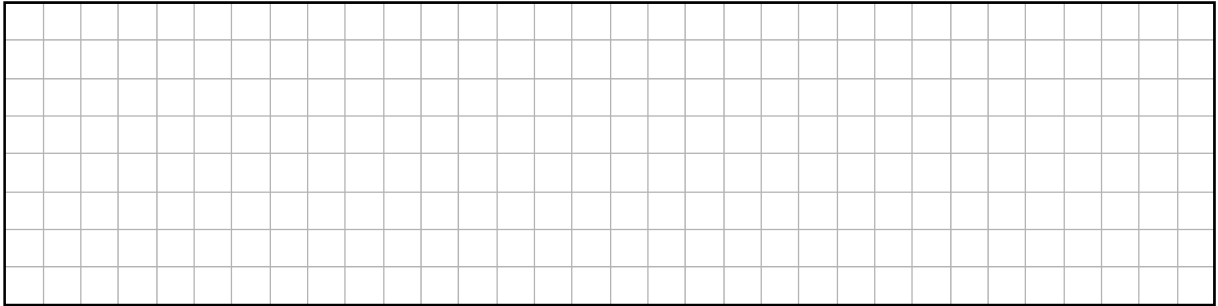

(a) Find $|SG|$. Give your answer in metres, correct to 1 decimal place.

(b) Find $|\angle HSG|$. Give your answer in degrees, correct to 2 decimal places.
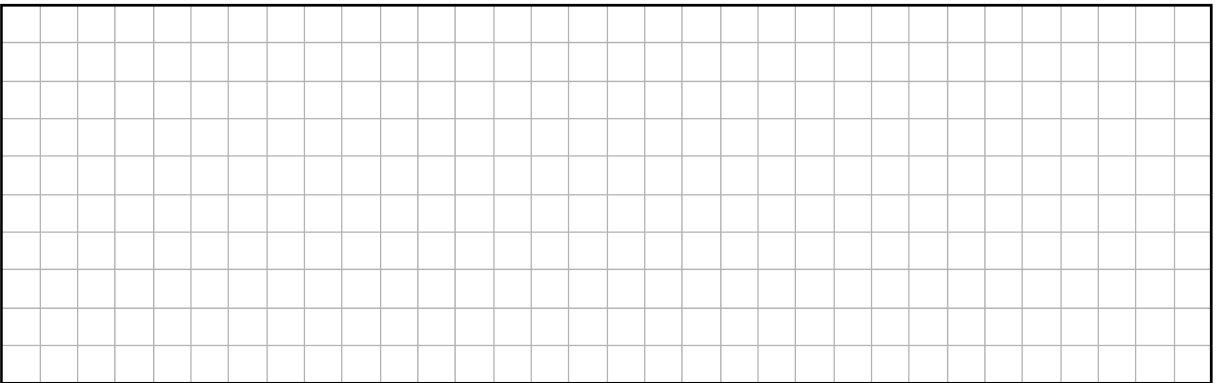
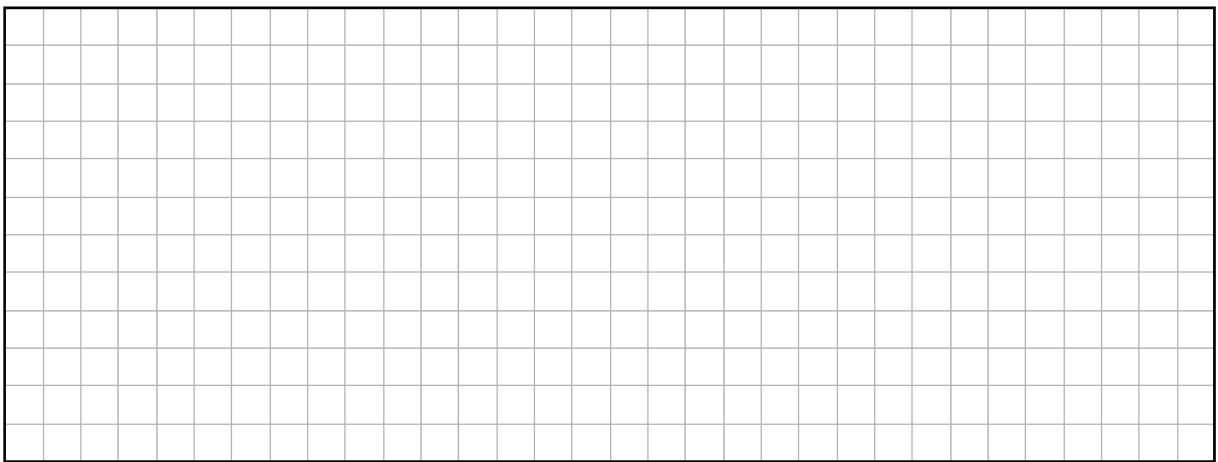**(c)** Find the area of ΔSGH. Give your answer in m², correct to 2 decimal places.

(d) **(i)** Find the area of ΔHSP, in terms of r, where r is the radius of the helicopter pad.

(ii) Show that the area of ΔSGH, in terms of r, can be written as 71·2r m².

(iii) Find the value of r. Give your answer in metres, correct to 1 decimal place.

This question continues on the next page.

(e) [ST] is a **vertical** pole at the point S.
The angle of elevation of the top of the pole from the point P is 14°.
Find the height of the pole.
Give your answer, in metres, correct to 1 decimal place.