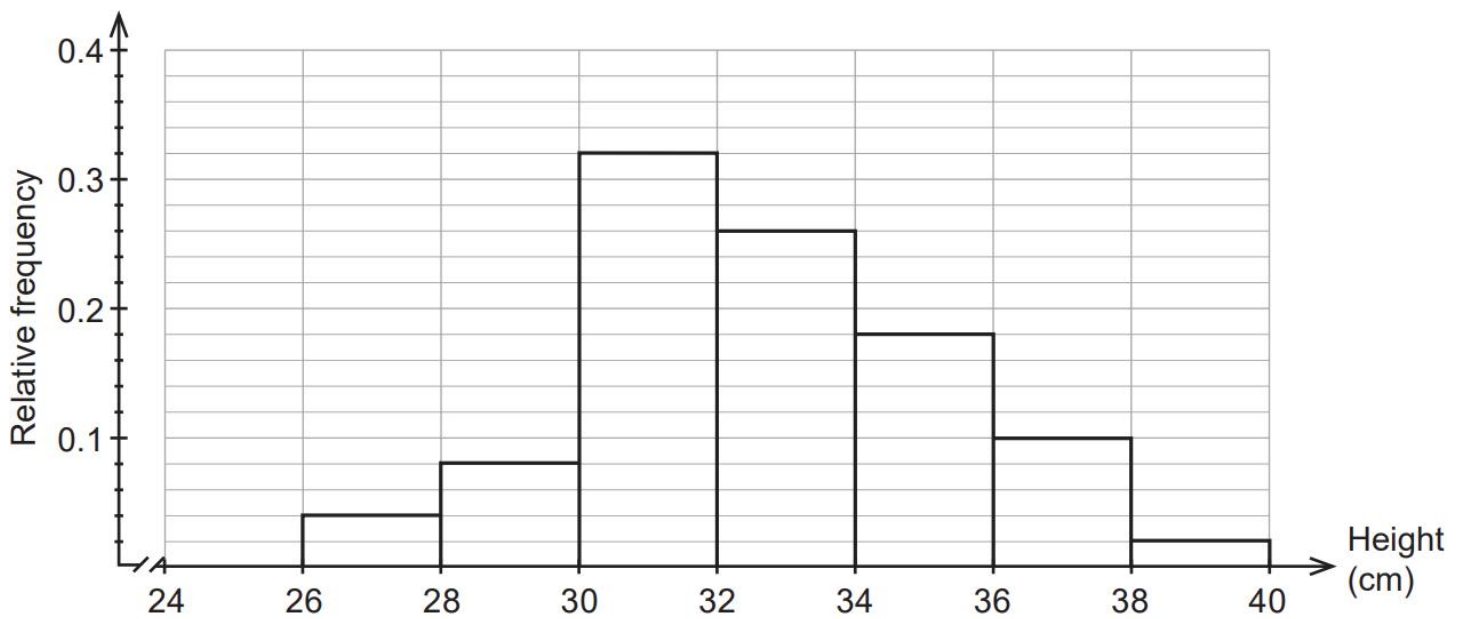


Question 4**(9 marks)**

The heights reached by a species of small plant at maturity are measured by a team of biologists. The results are shown in the histogram of relative frequencies below.



- (a) Determine the probability that a mature plant of this species reaches no higher than 30 cm. (1 mark)
- (b) If a mature plant reaches a height of at least 32 cm, what is the probability that its height reaches above 38 cm? (2 marks)

Another team of biologists is studying the mature heights of a species of hedge. The height, h metres, has a probability density function, $d(h)$, as given below.

$$d(h) = \begin{cases} \frac{h-1}{5} & \text{for } 1 \leq h \leq 2 \\ kh^2 & \text{for } 2 < h \leq 4 \\ 0 & \text{otherwise} \end{cases}$$

(c) What percentage of hedges from this study reaches a mature height less than 2 m? (3 marks)

(d) Determine the value of k . (3 marks)