3. The lengths, x mm, of 50 pebbles are summarised in the table below.

Length	Frequency
$20 \leqslant x < 30$	2
$30 \leqslant x < 32$	16
$32 \leqslant x < 36$	20
$36 \leqslant x < 40$	8
$40 \leqslant x < 45$	3
$45 \leqslant x < 50$	1

A histogram is drawn to represent these data.

The bar representing the class $32 \leqslant x < 36$ is 2.5 cm wide and 7.5 cm tall.

(a) Calculate the width and the height of the bar representing the class $30 \leqslant x < 32$

(3)

(b) Using linear interpolation, estimate the median of x

(2)

The weight, w grams, of each of the 50 pebbles is coded using $10y = w - 20$
These coded data are summarised by

$$\sum y = 104 \qquad \sum y^2 = 233.54$$

(c) Show that the mean of w is 40.8

(2)

(d) Calculate the standard deviation of w

(4)

The weight of a pebble recorded as 40.8 grams is added to the sample.

(e) Without carrying out any further calculations, state, giving a reason, what effect this would have on the value of

(i) the mean of w

(ii) the standard deviation of w

(3)

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Question 3 continued

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Question 3 continued

(Total for Question 3 is 14 marks)