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6. A machine cuts wood into pieces. The lengths, W metres, of the pieces produced by the machine are normally distributed with mean μ metres and standard deviation σ metres. It is known that

$$P(W < 3.968) = 0.1 \text{ and } P(3.968 < W < 4.026) = 0.75$$

(a) Calculate the value of μ and the value of σ

(5)

A second machine cuts wood into logs. The lengths, L cm, of the logs produced by this second machine are normally distributed with $L \sim N(30, 0.5^2)$

An outlier is a value that is greater than $Q_3 + 1.5 \times (Q_3 - Q_1)$ or smaller than $Q_1 - 1.5 \times (Q_3 - Q_1)$

A log is selected at random.

Given that $Q_1 = 29.7$ to 3 significant figures,

(b) find the probability that the length of this log is an outlier.

(5)

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Q6