7. A machine squeezes apples to extract their juice. The volume of juice, J ml, extracted from 1 kg of apples is modelled by a normal distribution with mean μ and standard deviation σ

Given that $\mu = 500$ and $\sigma = 25$ use standardisation to

(a) (i) show that $P(J > 510) = 0.3446$

(2)

(ii) calculate the value of d such that $P(J > d) = 0.9192$

(3)

Zen randomly selects 5 bags each containing 1 kg of apples and records the volume of juice extracted from each bag of apples.

(b) Calculate the probability that each of the 5 bags of apples produce less than 510 ml of juice.

(2)

Following adjustments to the machine, the volume of juice, R ml, extracted from 1 kg of apples is such that $\mu = 520$ and $\sigma = k$

Given that $P(R < r) = 0.15$ and $P(R > 3r - 800) = 0.005$

(c) find the value of r and the value of k

(7)

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TOTAL FOR PAPER IS 75 MARKS

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