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| **Topic 4: Statistics and Probability** | **Normal Distribution and Probability** |
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| 1. The lengths of apple seeds from a tree at SkyTop Orchard are approximated by a normal distribution with a mean of 8 mm and a standard deviation of 0.5 mm.

A seed from this apple tree is chosen at random. * 1. Calculate the probability that the length of the seed is less than 7.5 mm.

 It is known that 25% of the seeds have a length greater than *k* mm.* 1. Find the value of *k*.

 For a seed of length *d* mm chosen at random, $$P\left(8-m<d<8+m\right)=0.4$$ (c) Find the value of *m.*  |  (2 marks) (2 marks) (2 marks) |
| Mark scheme:1. $P\left(S<7.5\right) or X\~N\left(8,0.5^{2}\right) $

= 0.1591. $P\left(X<k\right)=0.75 or P\left(X>k\right)=0.25$

= 8.34 (c) $P\left(8-m<8.337<8+m\right)=0.4$$P \left(m< -0.337\right)=0.30 or P\left(m>0.337\right)=0.70$$ m=0.262$ | (M1)(A1)(M1)(A1)(M1)(A1) |