**MARKS**

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1. In a factory which manufactures beam balances from components, each balance is assembled by attaching a randomly-selected pan and pan-holder to each end of the balance arm. The distribution of pan weights in grams can be modelled by a $N(50, \sqrt{0.0005})$ distribution, and the model for the weights of the pan-holders is $N(10, \sqrt{0.0003})$. A balance is *un*acceptable if the combined weights of the pan and pan-holder on each side of the balance differ by more than 0.080 gm. What proportion of the balances manufactured in the factory will be unacceptable?

Proportion