# Normal Distribution Questions *[8 marks]*

The Brahma chicken produces eggs with weights in grams that are normally distributed about a mean of 55 g with a standard deviation of 7 g. The eggs are classified as small, medium, large or extra large according to their weight, as shown in the table below.

| Size | Weight (g) |
|---|---|
| Small | Weight $< 53$ |
| Medium | $53 \leq$ Weight $< 63$ |
| Large | $63 \leq$ Weight $< 73$ |
| Extra Large | Weight $\geq 73$ |

1a. There is a probability of 0.3 that a randomly chosen egg weighs more than $w$ grams. *[2 marks]*

Find $w$ .

## Markscheme

$\mathrm{P}(\text{Weight} > w) = 0.3$ ***(M1)***

$w = 58.7$ $(58.6708\ldots)$ ***(A1)(G2)***

**Note:** Award ***(M1)*** for correct region indicated on labelled diagram.

## Examiners report

[N/A]

1b. An egg is chosen at random. Find the probability that the egg is *[4 marks]*

(i) medium;

(ii) extra large.

## Markscheme

(i) $\mathrm{P}(53 \leqslant \text{Weight} < 63) = 0.486$ $(0.485902\ldots)$ ***(M1)(A1)(G2)***

**Note:** Award ***(M1)*** for correct region indicated on labelled diagram.

(ii) $\mathrm{P}(\text{Weight} > 73) = 0.00506$ $(0.00506402)$ ***(M1)(A1)(G2)***

**Note:** Award ***(M1)*** for correct region indicated on labelled diagram.

## Examiners report

[N/A]

1c. The probability that a Brahma chicken produces a large size egg is 0.121. Frank's Brahma chickens produce 2000 eggs each month. *[2 marks]*

Calculate an estimate of the number of large size eggs produced by Frank's chickens each month.

## Markscheme

Expected number of large size eggs

$= 2000(0.121)$ ***(M1)***
$= 242$ ***(A1)(G2)***

## Examiners report

[N/A]

Note: Since this is the first year this topic will be on the test, I don't have much to draw from.