

**AQA – Statistical distributions – A2 Mathematics P3****1. June/2020/Paper\_3/No.17**

The lifetime of Zapple smartphone batteries,  $X$  hours, is normally distributed with mean 8 hours and standard deviation 1.5 hours.

(a) (i) Find  $P(X \neq 8)$

[1 mark]

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(a) (ii) Find  $P(6 < X < 10)$

[1 mark]

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(b) Determine the lifetime exceeded by 90% of Zapple smartphone batteries.

[2 marks]

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**2. June/2019/Paper\_3/No.13**

Patrick is practising his skateboarding skills. On each day, he has 30 attempts at performing a difficult trick.

Every time he attempts the trick, there is a probability of 0.2 that he will fall off his skateboard.

Assume that the number of times he falls off on any given day may be modelled by a binomial distribution.

- (a) (i) Find the mean number of times he falls off in a day.

[1 mark]

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- (a) (ii) Find the variance of the number of times he falls off in a day.

[1 mark]

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- (b) (i) Find the probability that, on a particular day, he falls off exactly 10 times.

[2 marks]

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(b) (ii) Find the probability that, on a particular day, he falls off 5 or more times.

[3 marks]

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(c) Patrick has 30 attempts to perform the trick on each of 5 consecutive days.

(c) (i) Calculate the probability that he will fall off his skateboard at least 5 times on each of the 5 days.

[2 marks]

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(c) (ii) Explain why it may be unrealistic to use the same value of 0.2 for the probability of falling off for all 5 days.

[1 mark]

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(b) (i) Find  $P(X \neq 35)$

[1 mark]

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(b) (ii) Find  $P(X < 35)$

[2 marks]

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(c) Brownies are baked in batches of 13.

Calculate the probability that, in a batch of brownies, no more than 3 brownies are less than 35 grams.

You may assume that the masses of brownies are independent of each other.

[2 marks]

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