

**Topic: Discrete Random Variables**

A biased 4-sided spinner has the numbers 6, 7, 8 and 10 on it.

The discrete random variable  $X$  represents the score when the spinner is spun once and has the following probability distribution,

$x$	6	7	8	10
$P(X = x)$	0.5	0.2	$q$	$q$

where  $q$  is a probability.

(a) Find the value of  $q$

(1)

Karen spins the spinner repeatedly until she **either** gets a 7 **or** she has taken 4 spins.

(b) Show that the probability that Karen stops after taking her 3<sup>rd</sup> spin is 0.128

(2)

The random variable  $S$  represents the number of spins Karen takes.

(c) Find the probability distribution for  $S$

(4)

The random variable  $N$  represents the number of times Karen gets a 7

(d) Find  $P(S > N)$

(1)

**(Total for question = 8 marks)**