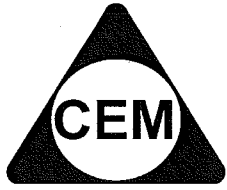


NAME :



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YEAR 12 – ADVANCED MATHS

REVIEW TOPIC (SP1)

PROBABILITY

HSC '94

(6)(a) 'A bag contains green, black, and red jellybeans. Therefore, if I choose one jellybean at random from the bag, the probability that it is black is $\frac{1}{3}$.'

Is this statement true or false? Explain why, in no more than one sentence.

(10) David has invented a game for one person. He throws two ordinary dice repeatedly until the sum of the two numbers shown is either 7 or 9. If the sum is 9, David wins. If the sum is 7, David loses. If the sum is any other number, he continues to throw until it is 7 or 9.

(i) Show that the probability that David wins on his first throw of the dice is $\frac{1}{9}$.

(ii) Calculate the probability that a second throw is needed.

$$\frac{13}{18}$$

(iii) What is the probability that David wins on his first, second, or third throw?

$$\frac{727}{2916}$$

(iv) Calculate the probability that David wins the game.

$$\frac{2}{5}$$

HSC '93

(7)(c) The die used in a new game has 20 faces. Each face has a different letter of the alphabet marked on it, however the letter Q, U, V, X, Y and Z have not been used.

- (i) The die is rolled twice. What is the probability that the same letter appears on the upper face twice ?

$$\frac{1}{20}$$

- (ii) The die is rolled three times. What is the probability that the letter E appears on the upper face exactly twice ?

$$\frac{57}{8000}$$

HSC '92

(4)(b) Pat and Chris each throw a die.

(Space for diagrams: i.e. tree diagram or table form or coordinate plane system)

(i) Find the probability that they throw the same number.

$$\boxed{\frac{1}{6}}$$

(ii) Find the probability that the number thrown by Chris is greater than the number thrown by Pat.

$$\boxed{\frac{5}{12}}$$

(8)(b) A box contains twelve chocolates, all of exactly the same appearance. Four of the chocolates are hard and eight are soft. Kim eats three chocolates chosen randomly from the box. Using a tree diagram, or otherwise, find the probability that :

(i) the first chocolate Kim eats is hard;

$$\frac{1}{3}$$

(ii) Kim eats three hard chocolates;

$$\frac{1}{55}$$

(iii) Kim eats exactly one hard chocolate.

$$\frac{28}{55}$$

HSC '91

(4)(c) An insurance company has calculated that the probability of a woman being alive in 40 years time is 0.8 and the probability of her husband being alive in 40 years time is 0.7. What is the probability that in 40 years time :

(i) both will be alive;

0.56

(ii) only one of them will be alive ?

0.38

HSC '90

(6)(c) Bob tosses two dice with faces numbered 1 to 6. He records the maximum of the two uppermost faces as a score.

- (i) Find the probability that he records the score 1 in a single throw of the two dice.

$$\frac{1}{36}$$

- (ii) Find the probability that he records the scores 1,1,1 in three tosses of the two dice.

$$\frac{1}{46656}$$

- (iii) Find the probability that he records the score 6 in a single throw of the two dice.

$$\frac{11}{36}$$

HSC '89

(4)(c) In a large school, the student population is 42% male and 58% female.
Two students are selected at random to take part in a survey.

Find, correct to two decimal places, the probability that :

(i) both are females;

0.34

(ii) both are of the same sex;

0.51

(iii) they are of different sexes.

0.49

(10)(a) In the Jackpot Lottery, the probability of the Jackpot prize won in any draw is approximately 1 in 50.

(i) What is the probability that the Jackpot prize will be won in each of three consecutive draws ?

$$\frac{1}{125\,000}$$

(ii) How many consecutive draws must be made for it to be 99% certain that a Jackpot prize will have been won ?