Name: _____ Date: _____

CW # 3-2: Math IB SL - Standard 30 - 33: Chapter 8 Probability

50 points

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1. A two digit number between 10 and 99 inclusive is written down at random. Find the probability that it is:

   a divisible by 5

   b divisible by 3

   c greater than 50

   d a square number.

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2. For events C and D it is known that:
   $P(C) = 0.7 \quad P(C' \cap D') = 0.25 \quad P(D) = 0.2$

   a Find $P(C \cap D')$.

   b Explain why C and D are not independent events.

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3. The two events A and B are such that $P(A) = 0.6$, $P(B) = 0.2$ and $P(A \mid B) = 0.1$. Calculate the probabilities that:

   a both of the events occur

   b at least one of the events occur

   c exactly one of the events occur

   d B occurs given that A has occurred.

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4. Let P(C) = 0.4; P(D) = 0.5; P(C|D) = 0.6.

   a Find P(C and D).

   b Are C and D mutually exclusive? Give a reason for your answer

   c Are C and D independent events? Give a reason for your answer

   d Find P(C or D).

   e Find P(D|C).

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5. Adrian has a box with 5 red and 3 green apples in it. He takes out an apple at random and eats it. He then takes out another apple at random and also eats it.

   a Find the probability that he eats

   i two red apples

   ii two apples of different colours.

   Sally also has a box with 5 red and 3 green apples in it. Sally is on a diet. She takes out an apple at random and then puts it back in the box. She then takes out another apple at random.

   b Find the probability that she takes

   i two red apples

   ii two apples of different colours.

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6. A control tower sends a message to a ship. The probability that the ship hears the message is $\frac{3}{4}$. The ship will reply if and only if it receives the message. If the ship replies, the probability that the tower hears the reply is $\frac{3}{5}$.

   a Sketch a probability tree to represent this information. (2 marks)

   b Hence find the probability that the tower hears a reply to the message it sends. (2 marks)

   c Write down the probability that it does not hear a reply. (2 marks)

   d Given that the tower did not hear a reply, find the probability that the ship did not hear the original message.