Key

1. Classify each pair of events as mutually exclusive or non-mutually exclusive.

		Event A	Event B
NM	a)	Randomly drawing a grey sock from a drawer	Randomly drawing a wool sock from a drawer
N	b)	Randomly selecting a student with brown eyes	Randomly selecting a student on the honour roll
ME	c)	Having an even number of students in your class	Having an odd number of students in your class
ME	d)	Rolling a six with a die	Rolling a prime number with a die
NM	e)	Your birthday falling on a Saturday next year	Your birthday falling on a weekend next year
NM	f)	Getting an A on the next test	Passing the next test

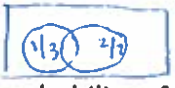
- 1 so no overlap

2. The probabilities that John will receive an A, B, C, D, or E on a test is 0.13, 0.26, 0.45, 0.11 and 0.05 respectively. What is the probability that John will get the following result?
   a) An A or B $0.13 + 0.26 = 0.39$
   b) At least a D $0.11 + 0.26 + 0.45 + 0.11 = 0.95$
   c) Less than A 0.87 $(1 - 0.13)$

3. In a large sample of families in Canada, it was found that 80% of the husbands and 60% of the wives were employed outside the home. In 53% of the cases, both the husband and wife were employed outside the home. Assume that the sample is representative of the whole population of Canada. What is the probability that
   a. At least one spouse is employed outside the home $P(H \cup W) = P(H) + P(W) - P(H \cap W)$ $= 87\%$
   b. Neither spouse is employed outside the home $1 - 0.87 = 0.13$ or 13%

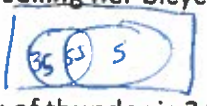
4. Environmentalists have accused a large company of dumping nuclear waste material in a local river. The probability that either the fish in the river or the animals that drink from the river will die is 11/21. The probability that only the fish will die is 1/3 and the probability that only the animals that drink from the river will die is 2/7. What is the probability that both the fish and the animals will die? $P(F \cup A)$

$\frac{11}{21} = \frac{1}{3} + \frac{2}{7} + ?$



overlap region! 2/21

5. A student feels that the probability of passing her driver's test is 90%, the probability of selling her bicycle is 60% and the probability of passing the test and selling her bicycle is 55%. Find the probability that she will pass the test or sell her bicycle.



$P(P \cup S) = P(P) + P(S) - P(P \cap S)$
$= 95\%$ 0.95

6. On a certain day, the probability of rain is 4/5, the probability of thunder is 3/5 and the probability of both is 2/5. What is the probability that it will rain or thunder?

$P(R \cup T) = P(R) + P(T) - P(R \cap T)$
$= 100\%$