Routine Probability Practice #3
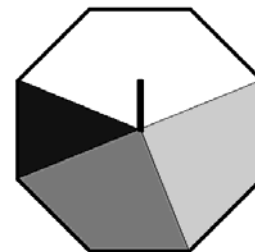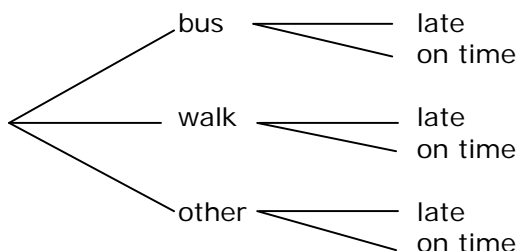
1. A spinner is shaped and coloured in the format to the right.

   a) If it is spun 100 times, how many white results would you predict?

   b) What is the probability that in two spins there will be at least one black result?

2. A school compares numbers doing Physics and Chemistry in Year 13.

	Boys	Girls
Chemistry only	32	35
Physics only	28	17
Both	49	42

   a) What is the probability that a randomly selected student will be doing chemistry?

   b) What is the probability a randomly selected student doing physics will be a girl?

   c) What is the probability a randomly selected girl student will be doing physics but not chemistry?

3. 60% of the students at a school take the bus, and 30% walk. Those that take the bus are late 10% of the time. Those that walk are late 5% of the time. The rest are only late 2% of the time.

   What is the probability that a student will be late?

4. If a pair of 8 sided dice are rolled, what is the probability of a double? (That is, both dice will have the same number showing.)
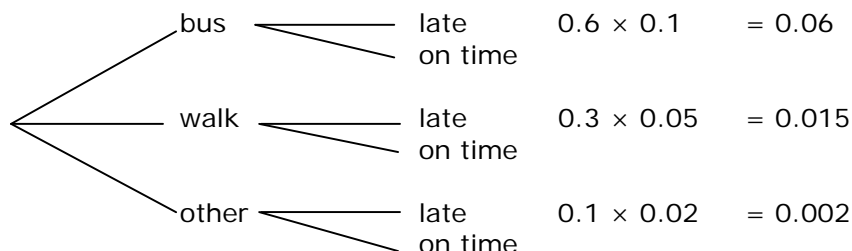
Answers: Routine Probability Practice #3

1. a) P(white) = $\frac{3}{8}$ = 0.375. For 100 spins, 100 × 0.375 = 37.5. In context = **37 or 38**

    b) P(at least one white) = 1 − P(3 black) = 1 − $\frac{5}{8} \times \frac{5}{8} \times \frac{5}{8}$ = $\frac{387}{512}$ = **0.7559** = **75.6%**

2. a) (32 + 35 + 49 + 42) do chemistry out of (32 + 35 + 28 + 17 + 49 + 42) total students

       = $\frac{158}{203}$ = **0.7783** = **77.8%**

    b) (28 + 17 + 49 +42) do physics, of whom (17 + 42) are girls = $\frac{59}{136}$ = **0.4338** = **43.4%**

    c) (35 + 17 + 42) girls, of which only 17 do physics only. = $\frac{17}{94}$ = **0.1809** = **18.1%**

3. 60% of the students at a school take the bus, and 30% walk. Those that take the bus are late 10% of the time. Those that walk are late 5% of the time. The rest are only late 2% of the time.

    What is the probability that a student will be late?

bus	late	0.6 × 0.1	= 0.06
	on time		
walk	late	0.3 × 0.05	= 0.015
	on time		
other	late	0.1 × 0.02	= 0.002
	on time		

    There are three paths that lead to being late that we need to add to together

    = 0.06 + 0.015 + 0.002 = **0.077** = **7.7%** chance of a random student being late

4. The first dice will score something. The second dice has a one in eight chance of being the same thing = $\frac{1}{8}$ = **0.125** = **12.5%**

    Alternatively there are 64 options (8 options on first × 8 on second) of which 8 are a double
    P(double) = $\frac{8}{64}$ = $\frac{1}{8}$

MAN vs MATHS 2013