

Basic Probability Practice #5

1. When two normal six-sided dice are rolled, the range of outcomes is shown on the table.

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

- a) How many different results are possible, if one takes care to distinguish between the two dice?
- b) How many of those results give a total for the two dice of 7?
- c) So what is the probability that a total of 7 will be rolled by two dice?

2. In a jar there are an equal number of yellow lollies and red lollies.

What is the probability that in three random draws, putting them back, at least two lollies drawn are yellow?

3. Billy is in Year 13. His timetable is divided as follows:

Calculus	Chemistry	Physics	English	RE	Free	PE
4	4	4	4	4	2	3

- a) What is the probability a randomly selected period is a free period?
- b) If you know he isn't in English or RE what is the probability he has a free period?

4. Billy has some coins in a jar. He closes his eyes, and picks them at random:

The probability he picks a 50 cent piece is 0.32.

He knows there are eight 50 cent coins in the jar. How many other coins must there be?

5. Acrefield College is a co-ed school (has both boys and girls). It has 80 Year 9 boys and 75 Year 9 girls. 20 of those boys play football, and 15 of those girls play football.

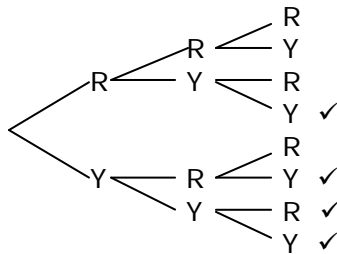
- a) What is the probability a randomly selected Year 9 plays football?
- b) If we know a Year 9 student plays football, what is the probability it is a boy?

Answers: Basic Probability Practice #5

	1	2	3	4	5	6
1	2	3	4	5	6	7
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1. a) There are $6 \times 6 = 36$ possible results.
- b) There are **six**.
- (1 + 6, 2 + 5, 3 + 4, 4 + 3, 5 + 2, 6 + 1)
- c) 6 out of 36 = $\frac{6}{36} = \frac{1}{6}$ (= 0.1666 = 16.7%)

2. There are $2 \times 2 \times 2 = 8$ possible results, all equally likely (since there are equal reds and yellows in the jar). Of 8 results there are 4 ways that at least two yellows can be drawn (YYY, YYR, YRY, RYY). Or we can use a tree:



The tree shows 4 out of 8 have two yellows (ticked) = $\frac{4}{8} = \frac{1}{2} = 0.5 = 50\%$

3. a) There are 2 free periods out of the 25 total, probability = $\frac{2}{25} = 0.08 = 8\%$
- b) There are still 2 free periods, but since he isn't doing English or RE it is out of the 17 **remaining** periods, probability = $\frac{2}{17} = 0.1176 = 11.8\%$
4. 8 out of x (our unknown total) = 0.32, so therefore $\frac{8}{x} = 0.32$

By algebra or guess and check, $x = 25$.

The total is 25, but 8 are 50 cent pieces, which means there are **17 other coins**.

5. a) 35 play football out of a total of 155. (As the selection is random, every boy or girl is equally likely and we have to just mix them all in.) Probability = $\frac{35}{155} = 22.6\%$
- b) We have to exclude any that don't play football, because we are told that the we know the student is Year 9 playing football. That leaves a total of 35 Y9 footballers. Of those 35, 20 are boys. So probability = 20 out of 35 = $\frac{20}{35} = 0.5714 = 57.1\%$