Past Papers Worksheet P2 Probability of Combined Events IGCSE Mathematics 0580

1. The probability that it will rain on any day is 1/5 . Calculate an estimate of the number of days it will rain in a month with 30 days. [1]
   0580/23/O/N/15 Q4)

2. The probability that a sweet made in a factory is the wrong shape is 0.0028 .
   One day, the factory makes 25000 sweets. Calculate the number of sweets that are expected to be the wrong shape. [2]
   0580/22/F/M/19 Q6)

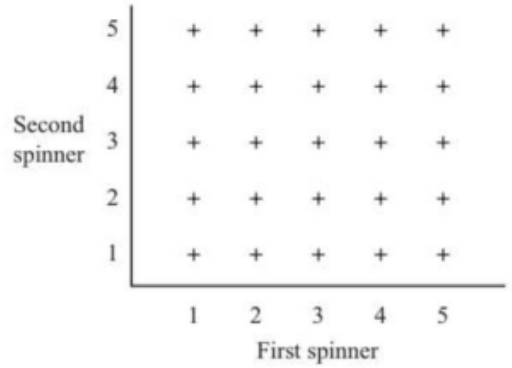
3. The probability that Kim wins a game is 0.72 . In one year Kim will play 225 games.
   Work out an estimate of the number of games Kim will win. [2]
   0580/23/M/J/18 Q7)

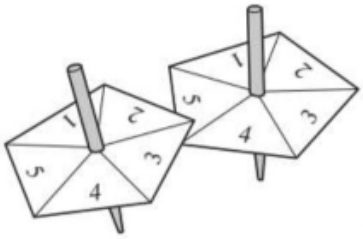
4. A letter is chosen at random from the list.
   (a) Find the probability that the letter chosen is A. [1]

   A L G E B R A

   (b) A letter is chosen at random from the list and then replaced.
   This is done 63 times. Work out the number of times the letter A is expected to be chosen.
   0580/27/M/J/14 Q2)

5. Two spinners have sections numbered from 1 to 5. Each is spun once and each number is equally likely. The possibility diagram is shown below.





Find the probability that

(a) both spinners show the same number, [2]

(b) the sum of the numbers shown on the two spinners is 7. [2]

0580/23/M/J/13 Q12)

6. The diagram shows a fair spinner.

Anna spins it twice and adds the scores.

(a) Complete the table for the total scores. [1]

(b) Write down the most likely total score. [1]

(c) Find the probability that Anna scores

(i) a total less than 6, [2]

(ii) a total of 3. [1]

		Score on first spin				
		1	3	3	4	6
Score on second spin	1	2	4	4	5	7
	3	4	6	6	7	9
	3	4	6	6	7	9
	4					
	6					

0580/21/M/J/17 Q20)

7. Katy picks a number at random from the numbers 2, 3 and 5.
   She then picks a number at random from the numbers 5, 6, 7 and 9.
   When she adds the two numbers the answer is even.
   Find the probability that **exactly one** of the numbers picked is a 5. [3]
   0580/22/O/N/22 Q19)

8. The probability that Pedro scores a goal in any match is 2/5 .
   Calculate the probability that Pedro scores a goal in each of the next two matches. [2]
   0580/23/M/J/17 Q6)

9. Simon has two boxes of cards.

Event	Probability
Triangle and red	
Square and red	$(1-t)r$
Triangle and blue	
Square and blue	

In one box, each card has one shape drawn on it that is either a triangle or a square.
In the other box, each card is coloured either red or blue.
Simon picks a card from each box at random.
The probability of picking a triangle card is t.
The probability of picking a red card is r.
Complete the table for the cards that Simon picks, writing each probability in terms of r and t. [3]
0580/21/M/J/17 Q8)

10. The diagram shows five cards. Two of the cards are taken at random, without replacement.

Find the probability that both cards show an even number.
[2]
0580/21/M/J/19 Q11)

11. A bag contains 7 red discs, 5 green discs and 2 pink discs.
    (a) Helen takes one disc at random, records the colour and replaces it in the bag.
    She does this 140 times. Find how many times she expects to take a green disc. [2]
    (b) Helen adds 9 green discs and some pink discs to the discs already in the bag.
    The probability of taking a green disc is now 2/7.
    Find the number of pink discs that Helen added to the bag. [2]
    0580/23/O/N/20 Q11)

12. In this question, give all your answers as fractions
    A box contains 3 red pencils, 2 blue pencils and 4 green pencils.
    Raj chooses 2 pencils at random, without replacement.
    Calculate the probability that
    (a) they are both red, [2]
    (b) they are both the same colour, [3]
    (c) exactly one of the two pencils is green. [3]
    0580/21/M/J/12 Q21)

13. (a) A box contains 3 blue pens, 4 red pens and 8 green pens only.
A pen is chosen at random from the box.
Find the probability that this pen is green. [1]
(b) Another box contains 7 black pens and 8 orange pens only.
Two pens are chosen at random from this box without replacement.
Calculate the probability that at least one orange pen is chosen. [3]
0580/21/M/J/18 Q20

14. Box A and box B each contain blue and green pens only.
Raphael picks a pen at random from box A and Paulo picks a pen at random from box B.
The probability that Raphael picks a blue pen is 2/3.
The probability that both Raphael and Paulo pick a blue pen is 8/15.
(a) Find the probability that Paulo picks a blue pen. [2]
(b) Find the probability that both Raphael and Paulo pick a green pen. [3]
0580/22/M/J/18 Q24)

15. Samira and Sonia each have a bag containing 20 sweets.
In each bag, there are 5 red, 6 green and 9 yellow sweets.
(a) Samira chooses one sweet at random from her bag.
Write down the probability that she chooses a yellow sweet. [1]
(b) Sonia chooses two sweets at random, without replacement, from her bag.
(i) Show that the probability that she chooses two green sweets is 3/38. [2]
(ii) Calculate the probability that the sweets she chooses are **not** both the same colour. [4]
0580/22/F/M/18 Q22)

16. Harris is taking a driving test.
The probability that he passes the driving test at the first attempt is 0.6 .
If he fails, the probability that he passes at any further attempt is 0.75 .
Calculate the probability that Harris
(a) passes the driving test at the second attempt, [2]
(b) takes no more than three attempts to pass the driving test. [2]
0580/22/O/N/19 Q18)

17. A group of 200 people were asked which city they would like to visit next.
The table shows the results.

City	London	Paris	New York	Tokyo
Number of people	50	48	56	46

(a) A person from the group is chosen at random.
Write down the probability that this person would like to visit either Paris or Tokyo next. [2]
(b) Two people are chosen at random from the group of 200.
Find the probability that one person would like to visit London next and the other person would like to visit New York next. [3]
0580/21/O/N/18 Q22)

18. The probability of Jamie hitting a target is $\frac{1}{3}$.
The probability that he hits the target for the first time on his nth attempt is $\frac{64}{2187}$.
Find the value of n. [2]
0580/22/F/M/23 Q24)

19. Dan either walks or cycles to school.

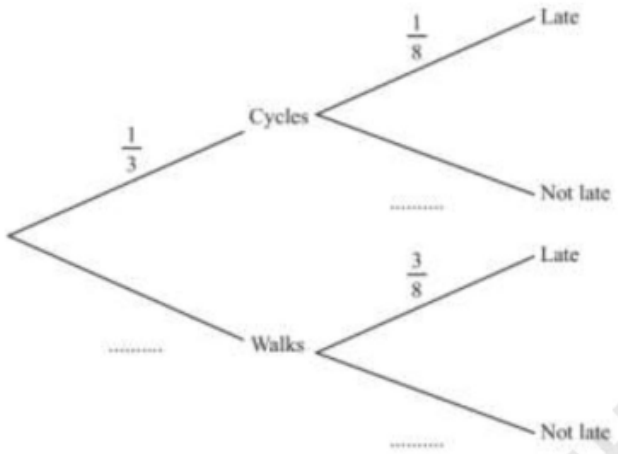
The probability that he cycles to school is 1/3

(a) Write down the probability that Dan walks to school. [1]

(b) When Dan cycles to school the probability that he is late is 1/8 .

When Dan walks to school the probability that he is late is 3/8 .

Complete the tree diagram. [2]



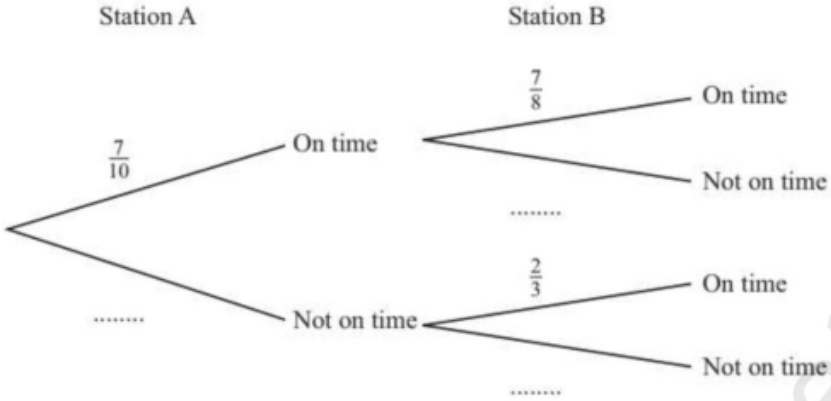
(c) Calculate the probability that

(i) Dan cycles to school and is late, [2]

(ii) Dan is not late. [3]

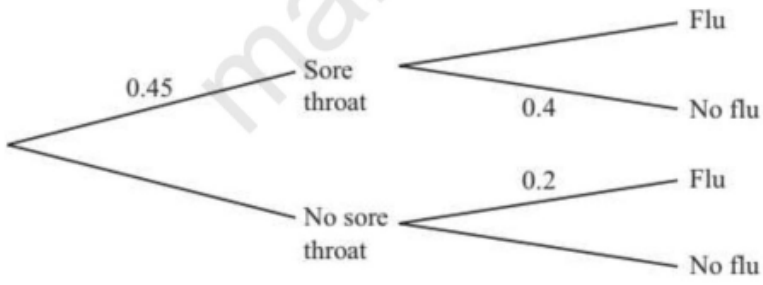
0580/22/F/M/16 Q21)

20. The probability that a train arrives at station A on time is 7/10 .
    If it is on time the probability that it arrives at station B on time is 7/8 .
    If it is not on time the probability that it arrives at station B on time is 2/3 .
    (a) Complete the tree diagram. [1]



    (b) Calculate the probability that the train arrives at station B on time. [3]
    0580/27/M/J/14 Q20)

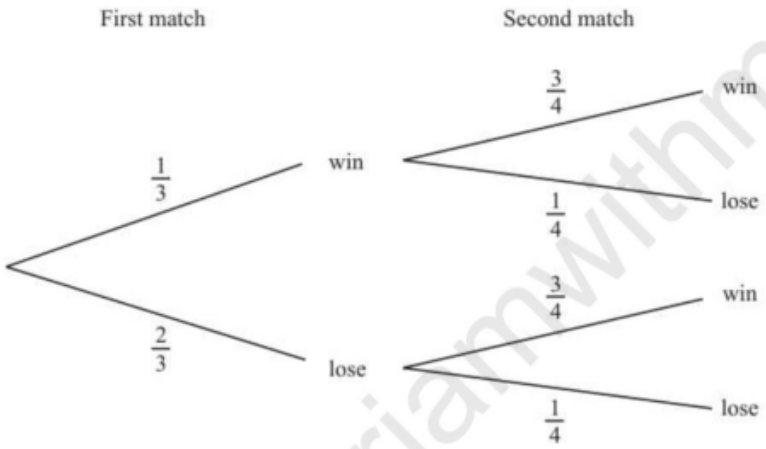
21. In a flu epidemic 45% of people have a sore throat.
    If a person has a sore throat the probability of **not** having flu is 0.4.
    If a person does not have a sore throat the probability of having flu is 0.2



    Calculate the probability that a person chosen at random has flu. [4]
    0580/21/O/N/11 Q10)

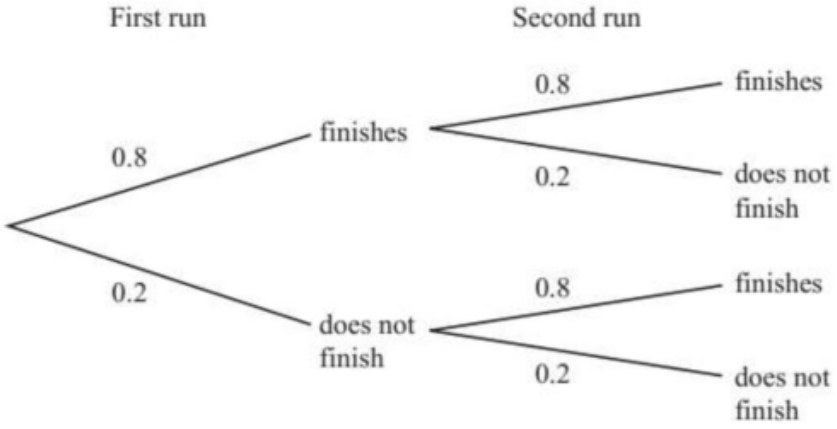
22. The probability that the school bus is late is 9/10.
    If the school bus is late, the probability that Seb travels on the bus is 15/16 .
    If the school bus is on time, the probability that Seb travels on the bus is 3/4.
    Find the probability that Seb travels on the bus. [3]
    0580/21/O/N/19 Q20)

23. The probability of a cricket team winning or losing in their first two matches is shown in the tree diagram.



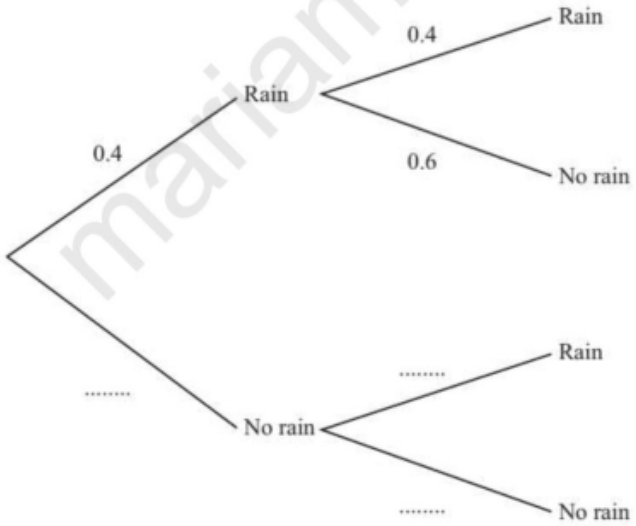
    Find the probability that the cricket team wins at least one match. [3]
    0580/21/M/J/16 Q19)

24. Samira takes part in two charity runs.
The probability that she finishes each run is 0.8



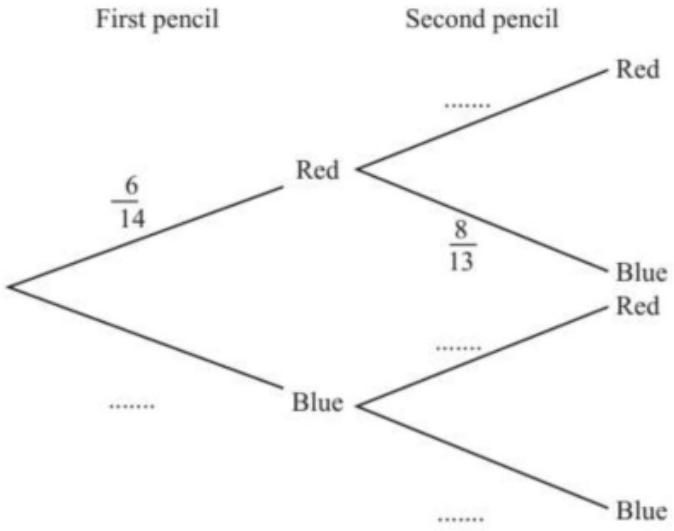
Find the probability that Samira finishes at least one run.
[3]
0580/23/O/N/15 Q18)

25. If it rains today the probability that it will rain tomorrow is 0.4 .
If it does not rain today the probability that it will rain tomorrow is 0.2 .
On Sunday it rained.
(a) Complete the tree diagram for Monday and Tuesday.
[2]



(b) Find the probability that it rains on at least one of the two days shown in the tree diagram. [3]
0580/21/O/N/14 Q18)

26. A box contains 6 red pencils and 8 blue pencils.
A pencil is chosen at random and not replaced.
A second pencil is then chosen at random.
(a) Complete the tree diagram [2]



(b) Calculate the probability that
(i) both pencils are red, [2]
(ii) at least one of the pencils is red. [3]

0580/22/O/N/15 Q23)

Answers

1) 6	14) (a)4/5 (b)1/15
2) 70	15) (a)9/20 (b)(i)30/380 (ii)258/380 or 129/190
3) 16	16) (a)0.3 (b) 0.975
4) (a) 2/7 (b)18	17) (a)94/200 (b)28/199
5) (a)5/25 (b)4/25	18) 7
6) (a) 5,7,7,8,10 ..... 7,9,9,10,12 (b)7(c)(i)7/25 oe)(ii) 0	19) (a)2/3 (b)2/3 , 7/8,5/8 (c)(i)1/24(ii)17/24
7) 3/7	20) (a)3/10 , 1/8 , 1/3 (b)195/240
8) 4/25	21) 19/50
9) rt , (1-r)t , (1-t)(1-r)	22) 147/160
10) 2/20	23) 5/6
11) (a)50 (b)26	24) 0.96
12) (a)1/12 (b)5/18 (c)5/9	25) (a) 0.6 0.2 0.8 in correct places (b) 0.52
13) (a)8/15 (b)168/210 or 4/5	26) (a)8/14 and 5/13 , 6/13 and 7/13 (b)(i)30/182(ii)126/182