# Section Check In – EN: Enumeration

## Questions

1. Calculate:

 (i) 

 (ii) 

 (iii)  [EN3,4,5]

2. Find the first 4 terms, in ascending powers of , of the binomial expansion of , giving each term in its simplest form. [EN1]

3. How many different arrangements are there for a set of letter blocks A, B, C and D picked at random? [EN3]

4. Find the coefficient of  in the expansion of . [EN1]

5. Abby, Bobby, Chikonda, David and Elisa are in the 100 m race. How many different ways are there to award Gold, Silver and Bronze Medals? [EN4]

6. Candidates applying for jobs in a large company take an aptitude test, as a result of which they are either accepted, rejected or retested, with probabilities 0.2, 0.5 and 0.3 respectively. When a candidate is retested there are just two possible outcomes, accepted or rejected, with probabilities 0.4 and 0.6 respectively.

 (i) Draw a probability tree diagram to illustrate the outcomes.

 (ii) Find the probability that a randomly selected candidate is accepted. [EN2]

7. Malik is playing a game in which he has to throw a 6 on a fair six-sided dice to start the game. Find the probability that

 (i) Malik throws a 6 for the first time on his third attempt,

 (ii) Malik needs at most ten attempts to throw a 6. [EN6]

8. Find the coefficient of  in the expansion of . [EN1]

9. (i) Write down the first 3 terms, in ascending powers of , of the binomial expansion of

 , where is a non-zero constant.

 (ii) Given that in the expansion of , the coefficient of is nine times the coefficient

 of , find the value of . [EN1]

10. A bag contains 9 discs numbered 1, 2, 3, 4, 5, 6, 7, 8, 9.

 Andrea chooses 3 discs at random, without replacement, and places them in a row.

 (i) How many different 3-digit numbers can be made?

 (ii) How many different odd 3-digit numbers can be made? [EN4,5]

**Extension**

Yasmin has 5 coins. One of these coins is biased with P(Heads) = 0.6. The other 4 coins are fair. She tosses all 5 coins once and records the number of heads obtained.

Complete the Probability distribution table for the number of heads.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of Head | 0 | 1 | 2 | 3 | 4 | 5 |
| Probability |  |  |  |  |  |  |

## Worked solutions

1. (i) 5 040

 (ii) 35

 (iii) 210

2. 

3. 

4.  Coefficient of  is 

5. 

6. (i)

Reject

Accept

Retest

Reject

Accept

0.2

0.5

0.3

0.4

0.6

 (ii) 0.2 + 0.3 × 0.4 = 0.32

7. (i) 

 (ii) 

8. 

 

 

 

 Coefficient of  is 

9. (i) 

 (ii) , , 

10. (i) 

 (ii) 

**Extension**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of Head | 0 | 1 | 2 | 3 | 4 | 5 |
| Probability | 0.025 | 0.1375 | 0.3 | 0.325 | 0.175 | 0.0375 |

P (0 Heads) = 

P (1 Head) = 

P (2 Heads) = 

P (3 Heads) = 

P (4 Heads) = 

P (5 Heads) = 

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