Probability

Exercise 11.2 – Question 3

Two 4 – sided dice with faces numbered 1 -4 are thrown. The total of the faces that the dice rest on is then worked out.

Solution

3a) Finding the probability that the total is even.

<div align="center">Die 1</div>

		1	2	3	4
Die 2	1	1,1 1+1=2	1,2 1+2=3	1,3 1+3=4	1,4 1+4=5
	2	2,1 2+1=3	2,2 2+2=4	2,3 2+3=5	2,4 2+4=6
	3	3,1 3+1=4	3,2 3+2=5	3,3 3+3=6	3,4 3+4=7
	4	4,1 4+1=5	4,2 4+2=6	4,3 4+3=7	4,4 4+4=8

The table shows that there are 16 possible rolls of two 4-sided dice.

n (sample space) = 16
8 rolls of two die have a even sum.

So:
n(event)= 18

$$p(event) = \frac{n(event)}{n(sample\ space)}$$

$$p(total\ is\ even) = \frac{8}{16} \quad Substituting$$

Answer: The probability that the total is even is 1/2.

3b) Finding the probability that the total is greater that 5.

Die 1

	1	2	3	4
1	1,1 1+1=2	1,2 1+2=3	1,3 1+3=4	1,4 1+4=5
2	2,1 2+1=3	2,2 2+2=4	2,3 2+3=5	2,4 2+4=6
3	3,1 3+1=4	3,2 3+2=5	3,3 3+3=6	3,4 3+4=7
4	4,1 4+1=5	4,2 4+2=6	4,3 4+3=7	4,4 4+4=8

Die 2 is the label for the rows.

6 rolls of two die { (2, 4), (3, 3), (3, 4), (4, 2), (4, 3), (4, 4)}
have a sum of greater than 5.

So:

n(event) = 6
n(sample space)= 16

$$p(\text{total is greater than 5}) = \frac{6}{16}$$

$$= \frac{3}{8}$$

Answer: The probability that the total is greater than five is 3/8.