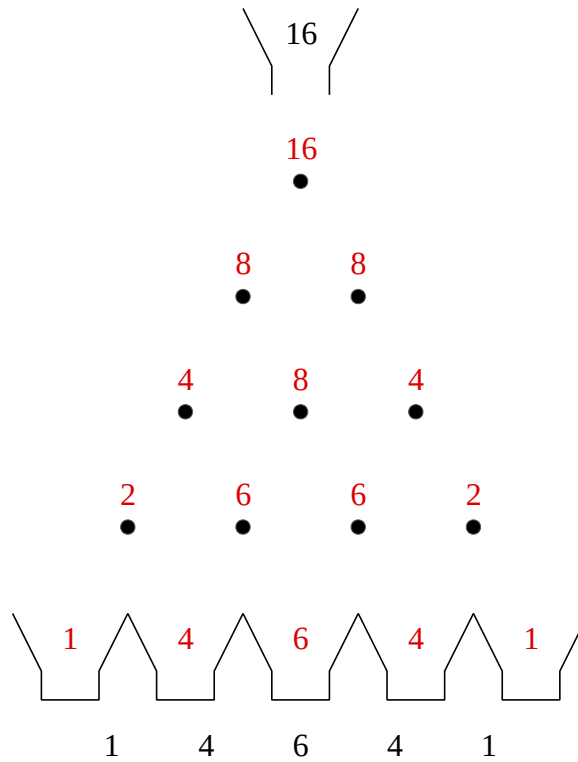


1.4 Answers

Additional Mathematics A-Level Pure Mathematics : Year 1 **Binomial Expansion**

1.4.1 Solution to 1.1 Example (Teaching Video)

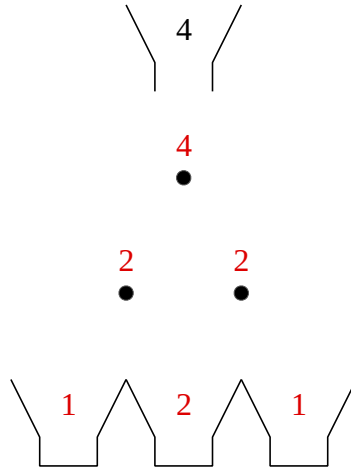


[6 marks]

1.4.2 Solution to 1.3 Exercise

Answer 1

(i) The number of balls arriving at each pin is,



[1 mark]

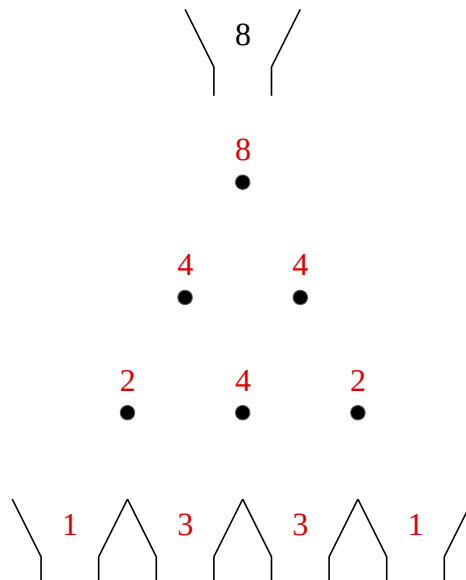
(ii) The distribution of the balls across the baskets is,

1 2 1

[1 mark]

Answer 2

(i) The number of balls arriving at each pin is,



[2 marks]

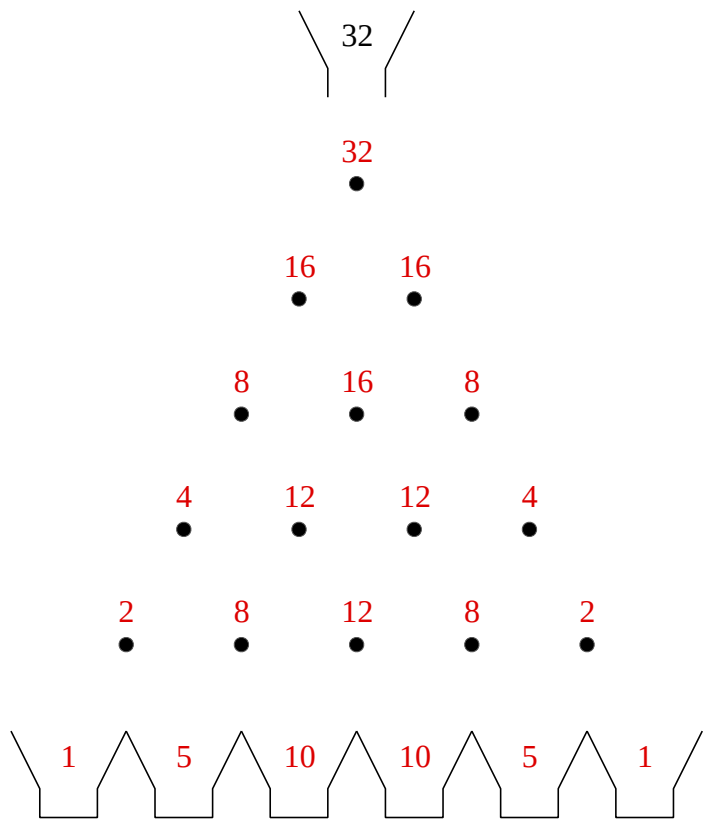
(ii) The distribution of the balls across the baskets is,

1 3 3 1

[2 marks]

Answer 3

(i) The number of balls arriving at each pin is,



[6 marks]

(ii) The distribution of the balls across the baskets is,

1 5 10 10 5 1

[2 marks]

Answer 4

Starting Number of Balls	Distribution of Balls in Baskets
4	1 2 1
8	1 3 3 1
16	1 4 6 4 1
32	1 5 10 10 5 1

[4 marks]

Answer 5

The distribution of the balls across the baskets will be,

1 6 15 20 15 6 1

[2 marks]

Answer 6

$$(1 + x)^0 = 1$$

$$(1 + x)^1 = 1 + 1x$$

$$(1 + x)^2 = 1 + 2x + 1x^2$$

$$(1 + x)^3 = 1 + 3x + 3x^2 + 1x^3$$

$$(1 + x)^4 = 1 + 4x + 6x^2 + 4x^3 + 1x^4$$

$$(1 + x)^5 = 1 + 5x + 10x^2 + 10x^3 + 5x^4 + 1x^5$$

$$(1 + x)^6 = 1 + 6x + 15x^2 + 20x^3 + 15x^4 + 6x^5 + 1x^6$$

[6 marks]

Answer 7

Pascal's Triangle is an array of numbers.

Any non-edge number is the sum of the number immediately above it to the left and the number immediately above it to the right.

The numbers in the array are called the “binomial coefficients”

Each row gives the coefficients of the powers of x in the expansion of $(1 + x)^n$

				1			
			1		1		
		1		2		1	
	1		3		3		1
	1	4		6		4	1
1	5	10		10	5		1
1	6	15	20	15	6		1

[4 marks]