# Chp 7 IB SL Maths

**1.** *[7 marks]*

The third term in the expansion of is . Find the possible values of *p* .

 **2a.** *[3 marks]*

Expand  and simplify your result.

 **2b.** *[3 marks]*

Find the term in  in  .

 **3.** *[5 marks]*

Find the term  in the expansion of  .

 **4a.** *[3 marks]*

Consider the expansion of  .

Find *b*.

 **4b.** *[3 marks]*

Find *k*.

 **5a.** *[3 marks]*

Expand  and simplify your result.

 **5b.** *[3 marks]*

Hence, find the term in  in  .

 **6a.** *[2 marks]*

Let  .

Expand  .

 **6b.** *[4 marks]*

Use the formula to show that the derivative of  is  .

 **6c.** *[4 marks]*

The tangent to the curve of f at the point  is parallel to the tangent at a point Q. Find the coordinates of Q.

 **6d.** *[3 marks]*

The graph of *f* is decreasing for  . Find the value of *p* and of *q*.

 **6e.** *[2 marks]*

Write down the range of values for the gradient of  .

 **7a.** *[1 mark]*

The fifth term in the expansion of the binomial  is given by  .

Write down the value of .

 **7b.** *[2 marks]*

Write down *a* and *b*, in terms of *p* and/or *q*.

 **7c.** *[3 marks]*

Write down an expression for the sixth term in the expansion.

 **8.** *[6 marks]*

Find the term in  in the expansion of  .

 **9a.** *[1 mark]*

Consider the expansion of  .

Write down the number of terms in the expansion.

 **9b.** *[5 marks]*

Find the term in  .

 **10a.** *[5 marks]*

In the expansion of  , the term in  can be expressed as  .

(a) Write down the value of  , of  and of  .

(b) Find the coefficient of the term in  .

 **10b.** *[3 marks]*

Write down the value of  , of  and of  .

 **10c.** *[2 marks]*

Find the coefficient of the term in  .

 **11.** *[7 marks]*

The constant term in the expansion of  , where  is . Find  .

 **12a.** *[1 mark]*

Consider the expansion of .

Write down the number of terms in this expansion.

 **12b.** *[4 marks]*

Find the term containing .

 **13.** *[7 marks]*

Consider the expansion of . The constant term is .

Find .

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**1.** *[7 marks]*

## Markscheme

attempt to expand binomial ***(M1)***

e.g.  , 

one correct calculation for term in  in the expansion for power 6  ***(A1)***

e.g. 15 , 

correct expression for term in ***(A1)***

e.g.  , 

**Notes:** Accept sloppy notation e.g. omission of brackets around  .

Accept absence of  in middle factor.

correct term ***(A1)***

e.g.  (accept absence of  )

setting up equation with their coefficient equal to 60 ***M1***

e.g.  ,  , 

***A1A1 N3***

***[7 marks]***

 **2a.** *[3 marks]*

## Markscheme

evidence of expanding ***M1***

e.g. ***A2 N2***



***[3 marks]***

 **2b.** *[3 marks]*

## Markscheme

finding coefficients,  , ***(A1)(A1)***

term is ***A1 N3***

***[3 marks]***

 **3.** *[5 marks]*

## Markscheme

evidence of using binomial expansion ***(M1)***

e.g. selecting correct term, 

evidence of calculating the factors, in any order ***A1A1A1***

e.g. 56 ,  ,  , 

 (accept =  to 3 s.f.) ***A1 N2***

 ***[5 marks]***

 **4a.** *[3 marks]*

Consider the expansion of  .

## Markscheme

valid attempt to find term in ***(M1)***

e.g.  , 

correct equation ***A1***

e.g. 

 ***A1 N2***

 ***[3 marks]***

 **4b.** *[3 marks]*

## Markscheme

evidence of choosing correct term ***(M1)***

e.g. 7th term, 

correct expression ***A1***

e.g. 

 (accept  ) ***A1 N2***

 ***[3 marks]***

 **5a.** *[3 marks]*

## Markscheme

evidence of expanding ***M1***

e.g.  , 

***A2 N2***

 ***[3 marks]***

 **5b.** *[3 marks]*

## Markscheme

finding coefficients 24 and 1 ***(A1)(A1)***

term is ***A1 N3***

***[3 marks]***

 **6a.** *[2 marks]*

Let  .

## Markscheme

attempt to expand ***(M1)***

***A1 N2***

***[2 marks]***

 **6b.** *[4 marks]*

## Markscheme

evidence of substituting ***(M1)***

correct substitution ***A1***

e.g. 

simplifying ***A1***

e.g. 

factoring out *h* ***A1***

e.g. 

***AG N0***

 ***[4 marks]***

 **6c.** *[4 marks]*

## Markscheme

***(A1)***

setting up an appropriate equation ***M1***

e.g. 

at Q,  (Q is ) ***A1 A1***

***[4 marks]***

 **6d.** *[3 marks]*

## Markscheme

recognizing that *f* is decreasing when ***R1***

correct values for *p* and *q* (but do not accept  ) ***A1A1 N1N1***

e.g.  ;  ; an interval such as 

***[3 marks]***

 **6e.** *[2 marks]*

## Markscheme

 ,  , ***A2 N2***

***[2 marks]***

 **7a.** *[1 mark]*

The fifth term in the expansion of the binomial  is given by  .

## Markscheme

***A1 N1***

***[1 mark]***

 **7b.** *[2 marks]*

## Markscheme

 ,  (or  ,  ) ***A1A1 N1N1***

***[2 marks]***

 **7c.** *[3 marks]*

## Markscheme

 ***A1A1A1 N3***

***[3 marks]***

 **8.** *[6 marks]*

## Markscheme

evidence of substituting into binomial expansion ***(M1)***

e.g. 

identifying correct term for  ***(M1)***

evidence of calculating the factors, in any order ***A1A1A1***

e.g.  ; 

**Note**: Award ***A1*** for each correct factor.

***A1 N2***

**Note**: Award ***M1M1A1A1A1A0*** for 1080 with working shown.

***[6 marks]***

 **9a.** *[1 mark]*

Consider the expansion of  .

## Markscheme

10 terms ***A1 N1***

***[1 mark]***

 **9b.** *[5 marks]*

## Markscheme

evidence of binomial expansion ***(M1)***

e.g. , , Pascal’s triangle

evidence of correct term ***(A1)***

e.g. 8th term,  ,  , 

correct expression of complete term ***(A1)***

e.g.  ,  , 

 (accept  ) ***A1 N2***

***[4 marks]***

 **10a.** *[5 marks]*

In the expansion of  , the term in  can be expressed as  .

## Markscheme

(a)  ,  ,  (accept ) ***A1A1A1 N3***

***[3 marks]***

(b) correct working ***(A1)***

*eg*   ,  ,  ,  , 

coefficient of term in  is ***A1 N2***

**Note**: Do not award the final ***A1*** for an answer that contains .

***[2 marks]***

***Total [5 marks]***

 **10b.** *[3 marks]*

## Markscheme

 ,  ,  (accept ) ***A1A1A1 N3***

***[3 marks]***

 **10c.** *[2 marks]*

## Markscheme

correct working ***(A1)***

*eg*   ,  ,  ,  , 

coefficient of term in  is ***A1 N2***

**Note**: Do not award the final ***A1*** for an answer that contains .

***[2 marks]***

***Total [5 marks]***

 **11.** *[7 marks]*

## Markscheme

evidence of binomial expansion  ***(M1)***

*eg* selecting correct term,

evidence of identifying constant term in expansion for power  ***(A1)***

*eg*   , 4 term

evidence of correct term (may be seen in equation) ***A2***

*eg*   , 

attempt to set up **their** equation ***(M1)***

*eg*  , 

correct equation in one variable ***(A1)***

*eg*   , 

***A1 N4***

***[7 marks]***

 **12a.** *[1 mark]*

Consider the expansion of .

## Markscheme

11 terms ***A1 N1***

***[1 mark]***

 **12b.** *[4 marks]*

## Markscheme

evidence of binomial expansion ***(M1)***

*eg* , attempt to expand

evidence of choosing correct term ***(A1)***

*eg* , , 

correct working ***(A1)***

*eg* , ,

***A1 N3***

***[4 marks]***

 **13.** *[7 marks]*

## Markscheme

valid approach ***(M1)***

*eg* ,

, Pascal’s triangle to  line

attempt to find value of *r* which gives term in ***(M1)***

*eg* exponent in binomial must give 

correct working ***(A1)***

*eg* 

evidence of correct term ***(A1)***

*eg* 

equating **their** term and 16128 to solve for  ***M1***

*eg* 

***A1A1 N2***

**Note:** If no working shown, award ***N0*** for .

***Total [7 marks]***

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