# 1.10 Expressions with non-integer exponents\_P1

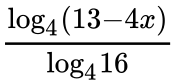
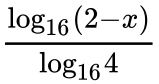
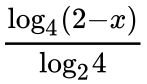
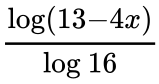
**1.** *[7 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

**Note:** The first three ***A*** marks are awarded for correct application of log properties, including with incorrect expressions, and in any order.

correct application of change of base (accept any base)       ***(A1)***

*eg*   ,  ,  ,  

correct numerical value       ***(A1)***

*eg*   ,  

correct application of         ***(A1)***

*eg*   

correct equation without logs       ***A1***

*eg*   ,  ,  

correct working       ***A1***

*eg*   

       ***A2 N2***

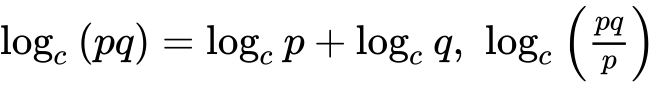
***[7 marks]***

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

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

valid approach involving addition or subtraction       ***M1***  
*eg*  

correct application of log law      ***A1***  
*eg*  

    ***AG N0***

***[2 marks]***

**2b.** *[6 marks]*

## Markscheme

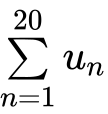
**METHOD 1** (finding  and *d*)

recognizing  (seen anywhere)      ***(A1)***

attempt to find  or *d* using      ***(M1)***  
eg  , , correct value of  or *d*

 = 2, *d* = 3 (seen anywhere)      ***(A1)(A1)***

correct working    ***(A1)***  
*eg*  

 = 610     ***A1 N2***

**METHOD 2** (expressing *S* in terms of *c*)

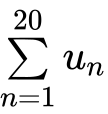
recognizing  (seen anywhere)      ***(A1)***

correct expression for *S* in terms of *c*      ***(A1)***  
*eg*  

  (seen anywhere)     ***(A1)(A1)***

correct working      ***(A1)***

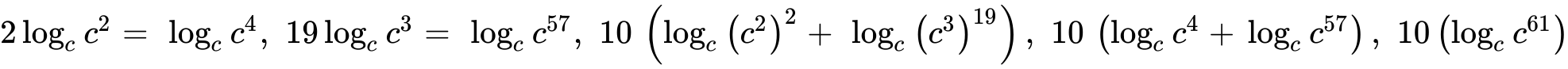
*eg*  

 = 610     ***A1 N2***

**METHOD 3** (expressing *S* in terms of *c*)

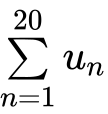
recognizing  (seen anywhere)      ***(A1)***

correct expression for *S* in terms of *c*      ***(A1)***  
*eg*  

correct application of log law     ***(A1)***  
eg  

correct application of definition of log      ***(A1)***  
eg  

correct working     ***(A1)***  
eg  

 = 610     ***A1 N2***

***[6 marks]***

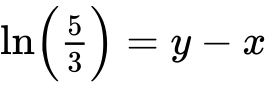
**3a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

correct approach     ***(A1)***

*eg*

    ***A1     N2***

***[2 marks]***

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

## Markscheme

recognizing factors of 45 (may be seen in log expansion)     ***(M1)***

*eg*

correct application of      ***(A1)***

*eg*

correct working     ***(A1)***

*eg*

    ***A1     N3***

***[4 marks]***

**4a.** *[1 mark]*

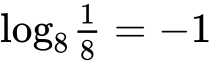
## Markscheme

(i)          ***A1     N1***

***[1 mark]***

**4b.** *[1 mark]*

## Markscheme

(ii)          ***A1     N1***

***[1 mark]***

**4c.** *[1 mark]*

## Markscheme

(iii)          ***A1     N1***

***[1 mark]***

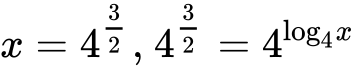
**4d.** *[3 marks]*

## Markscheme

correct equation with **their** three values     ***(A1)***

*eg*     

correct working involving powers     ***(A1)***

*eg*     

     ***A1     N2***

***[3 marks]***

**5a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

correct approach     ***(A1)***

*eg*     

      ***A1     N2***

***[2 marks]***

**5b.** *[2 marks]*

## Markscheme

correct simplification     ***(A1)***

*eg*     

      ***A1      N2***

***[2 marks]***

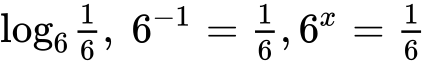
**5c.** *[3 marks]*

## Markscheme

correct simplification     ***(A1)***

*eg*     

correct working     ***(A1)***

*eg*     

     ***A1     N2***

***[3 marks]***

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