# 1.9 Log laws\_P\_2

**1.** *[5 marks]*

## Markscheme

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

recognition of the other root        ***(A1)***

        ***M1A1***

**Note:** Award ***M1***for sum of the roots, ***A1***for 3. Award ***A0M1A0*** for just .

       ***(M1)***

       ***A1***

       ***AG***

***[5 marks]***

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

## Markscheme

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

valid approach      ***(M1)***

*eg* one correct value

−0.453620, 6.14210

*a* = −0.454, *b* = 6.14      ***A1A1 N3***

***[3 marks]***

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

## Markscheme

correct substitution    ***(A1)***

*eg*−0.454 ln 3.57 + 6.14

correct working     ***(A1)***

*eg* ln *y* = 5.56484

261.083 (260.409 from 3 sf)

*y* = 261, (*y* = 260 from 3sf)       ***A1 N3***

**Note:** If no working shown, award ***N1*** for 5.56484.  
If no working shown, award ***N2***for ln *y* = 5.56484.

***[3 marks]***

**2c.** *[7 marks]*

## Markscheme

**METHOD 1**

valid approach for expressing ln *y* in terms of ln *x*      ***(M1)***

*eg* 

correct application of addition rule for logs      ***(A1)***

*eg* 

correct application of exponent rule for logs       ***A1***

*eg* 

comparing one term with regression equation (check ***FT***)      ***(M1)***

*eg*

correct working for *k*      **(A1)**

*eg*

465.030

 (464 from 3sf)     ***A1A1 N2N2***

**METHOD 2**

valid approach      ***(M1)***

*eg*

correct use of exponent laws for      ***(A1)***

*eg*

correct application of exponent rule for      ***(A1)***

*eg*

correct equation in *y*      ***A1***

*eg*

comparing one term with equation of model (check ***FT***)      ***(M1)***

*eg*

465.030

 (464 from 3sf)     ***A1A1 N2N2***

**METHOD 3**

valid approach for expressing ln *y* in terms of ln *x* (seen anywhere)      ***(M1)***

*eg*

correct application of exponent rule for logs (seen anywhere)      ***(A1)***

*eg*

correct working for *b* (seen anywhere)      ***(A1)***

*eg*

correct application of addition rule for logs      ***A1***

*eg*

comparing one term with equation of model (check ***FT***)     ***(M1)***

*eg*

465.030

 (464 from 3sf)     ***A1A1 N2N2***

***[7 marks]***

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

## Markscheme

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

strong, negative (both required)     ***A2     N2***

***[2 marks]***

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

## Markscheme

**METHOD 1**

valid approach     ***(M1)***

*eg*

correct use of exponent laws for      ***(A1)***

*eg*

comparing coefficients/terms     ***(A1)***

*eg*

    ***A1     N3***

**METHOD 2**

valid approach     ***(M1)***

*eg*

correct use of log laws for      ***(A1)***

*eg*

comparing coefficients     ***(A1)***

*eg*

    ***A1     N3***

***[4 marks]***

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

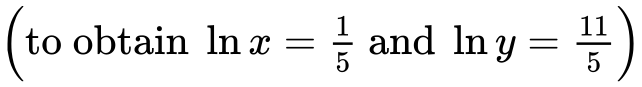
## Markscheme

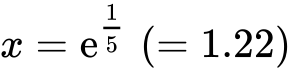
\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

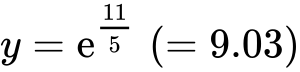
**METHOD 1**

    ***A1***

    ***(M1)A1***

attempting to solve for  and       ***(M1)***

    ***A1***

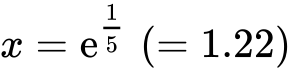
    ***A1***

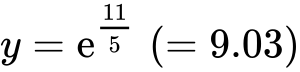
**METHOD 2**

    ***A1***

    ***(M1)A1***

attempting to solve for      ***(M1)***

    ***A1***

    ***A1***

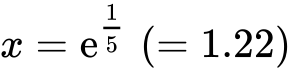
**METHOD 3**

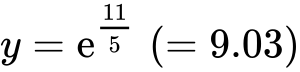
    ***A1***

    ***A1***

    ***(M1)***

substituting  into  (to obtain )     ***M1***

    ***A1***

    ***A1***

***[6 marks]***

Printed for SANSKAR SCHOOL

© International Baccalaureate Organization 2019

International Baccalaureate® - Baccalauréat International® - Bachillerato Internacional®