# 1.5 Intro to logs\_P\_2

**1a.** *[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]***

**1b.** *[3 marks]*

## Markscheme

**METHOD 1**

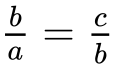
let the geometric series be , , 

      ***M1***

       ***A1***

hence one of the roots is       ***R1***

**METHOD 2**



      ***M1***

       ***A1***

hence one of the roots is       ***R1***

***[3 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***

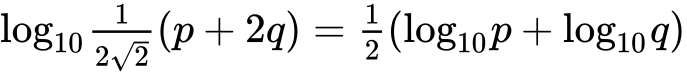
**Note:** If no working shown, award ***N1*** for 5.56484.  
If no working shown, award ***N2***for ln *y* = 5.56484.

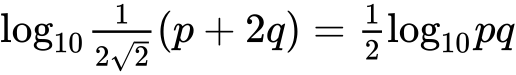
***[3 marks]***

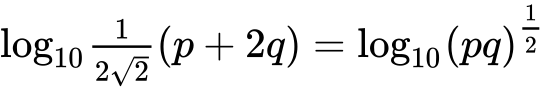
**3.** *[5 marks]*

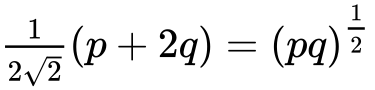
## Markscheme

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



     ***(M1)***

     ***(M1)***

     ***(A1)***







     ***M1***

hence      ***A1***

***[5 marks]***

**4a.** *[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]***

**4b.** *[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]***

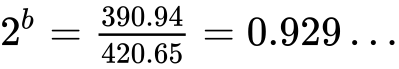
**5a.** *[4 marks]*

## Markscheme

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

     ***A1***

     ***M1***

     ***A1***

     ***A1***

***[4 marks]***

**5b.** *[1 mark]*

## Markscheme

     ***A1***

**Note:** Accept 5sf answers between 337.44 and 337.67.

***[1 mark]***

**5c.** *[1 mark]*

## Markscheme

 Percentage error 1.29%     ***A1***

**Note:** Accept negative values of the above.

***[1 mark]***

**5d.** *[2 marks]*

## Markscheme

likely not to be a good fit for larger values of      ***R1***

likely to be quite a good fit for values close to 8     ***R1***

***[2 marks]***

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

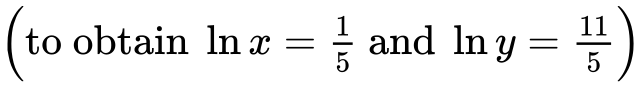
## Markscheme

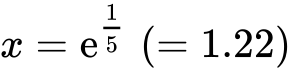
\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

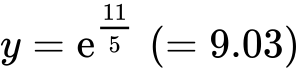
**METHOD 1**

    ***A1***

    ***(M1)A1***

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

    ***A1***

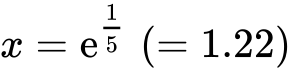
    ***A1***

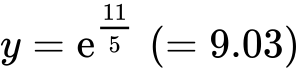
**METHOD 2**

    ***A1***

    ***(M1)A1***

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

    ***A1***

    ***A1***

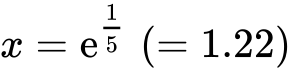
**METHOD 3**

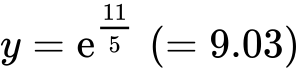
    ***A1***

    ***A1***

    ***(M1)***

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

    ***A1***

    ***A1***

***[6 marks]***

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