1.15 Core Pure: Polar Coordinates and Hyperbolic Functions Depth: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Solve the equation $33 \cosh x - 27 \sinh x = 21$, giving your answers as exact logarithms.

(a) Show that the equation can be written as $6e^{2x} - 42e^{x} + 60 = 0$. **(3)**

(b) Hence solve the equation. **(4)**

(Total for Question 1 is 7 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 1.15 Core Pure: Polar Coordinates and Hyperbolic Functions Depth: 10-minute Pack

Question 1

(a) writes cosh $x = (e^x + e^{-x})/2$ and sinh $x = (e^x - e^{-x})/2$	**M1**
(a) multiplies through by e^x and collects terms	**M1**
(a) $6e^{2x} - 42e^x + 60 = 0$ (cso)	**A1**
(a) Answer: $6e^{2x} - 42e^x + 60 = 0$	
(b) treats as a quadratic in e^x and factorises	**M1**
(b) $e^x = 2$ or $e^x = 5$	**A1**
(b) takes natural logs	**M1**
(b) $x = \ln 2$ and $x = \ln 5$	**A1**
(b) Answer: $x = \ln 2$, $x = \ln 5$	

© Revision Library | revisionlibrary.co.uk