

1. Solve the equation  $3^x = 12$

(2)

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2. Solve for  $x$ ,  $16 - 3^{4+x} = 0$

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3. Solve the following equation,  $2^{2x} + 2^x - 6 = 0$

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4. Solve the equation,  $3(16^x) - 4^{x+2} + 5 = 0$

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5. Sketch the curves  $y = 3^x$  and  $y = \left(\frac{1}{3}\right)^x$  on the same diagram.

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## Solutions

1.

$x \log 3 = \log 12$	<b>M1</b>
$x = \log 12 \div \log 3$	<b>M1</b>
$x = 2.26$	

2.

$(4 + x) \log 3 = \log 16$	<b>M1</b>
$x = (\log 16 \div \log 3) - 4$	<b>M1</b>
$x = -1.48$	

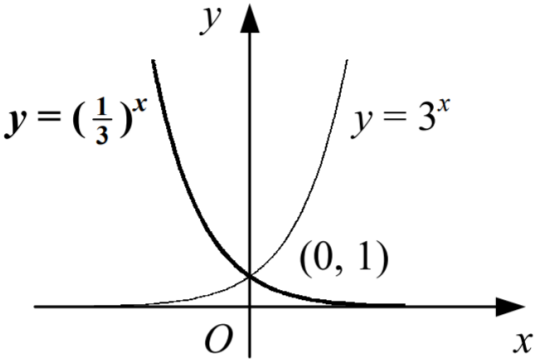
3.

$(2^x + 3)(2^x - 2) = 0$	<b>M1</b>
$2^x = -3$	<b>M1</b>
No solutions	
$2^x = 2$	<b>M1</b>
$x = 1$	

4.

$3(4^{2x}) - 16(4^x) + 5 = 0$	<b>M1</b>
$(3(4^x) - 1)(4^x - 5) = 0$	
$4^x = \frac{1}{3}$	<b>M1</b>
$x = \frac{\log \frac{1}{3}}{\log 4} = -0.79$	
$4^x = 5$	<b>M1</b>
$x = \frac{\log 5}{\log 4} = 1.16$	

5.

<p>Shape of graph 1 <b>M1</b></p> <p>Shape of graph 2 <b>M1</b></p> <p>Co-ordinate (0, 1) marked <b>M1</b></p>	
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