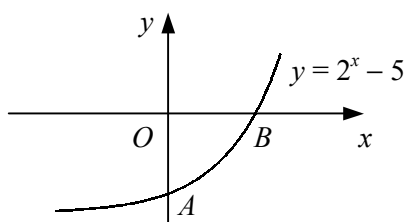


- 1 Find, to 3 significant figures, the value of
a $\log_{10} 60$ **b** $\log_{10} 6$ **c** $\log_{10} 253$ **d** $\log_{10} 0.4$
- 2 Solve each equation, giving your answers to 2 decimal places.
a $10^x = 14$ **b** $2(10^x) - 8 = 0$ **c** $10^{3x} = 49$
d $10^{x-4} = 23$ **e** $10^{2x+1} = 130$ **f** $100^x - 5 = 0$
- 3 Solve each equation, giving your answers to 3 significant figures.
a $3^x = 12$ **b** $2^x = 0.7$ **c** $8^{-y} = 3$ **d** $4^{\frac{1}{2}x} - 0.3 = 0$
e $5^{t+3} = 24$ **f** $16 - 3^{4+x} = 0$ **g** $7^{2x+4} = 12$ **h** $5(2^{3x+1}) = 62$
i $4^{2-3x} = 32.7$ **j** $5^x = 6^{x-1}$ **k** $7^{y+2} = 9^{y+1}$ **l** $4^{5-x} = 11^{2x-1}$
m $4^{\frac{1}{2}x+3} - 5^{1-2x} = 0$ **n** $2^{3y-2} = 3^{2y+5}$ **o** $7^{2x+5} = 7(11^{3x-4})$ **p** $3^{2x} = 3^{x-1} \times 2^{4+x}$
- 4 Solve the following equations, giving your answers to 2 decimal places where appropriate.
a $2^{2x} + 2^x - 6 = 0$ **b** $3^{2x} - 5(3^x) + 4 = 0$ **c** $5^{2x} + 12 = 8(5^x)$
d $2(4^x) + 3(4^{-x}) = 7$ **e** $2^{2y+1} + 7(2^y) - 15 = 0$ **f** $3^{2x+1} - 17(3^x) + 10 = 0$
g $25^t + 5^{t+1} - 24 = 0$ **h** $3^{2x+1} + 15 = 2(3^{x+2})$ **i** $3(16^x) - 4^{x+2} + 5 = 0$
- 5 Find the set of values of x for which
a $2^x > 5$ **b** $6^x \leq 10\,000$ **c** $4^{2x} < 21$ **d** $3^{x+1} \geq 50$
e $5^{3x-2} < 18$ **f** $(0.5)^x \geq 0.01$ **g** $(0.3)^x < 0.002$ **h** $(0.4)^{x-3} \leq 0.005$
- 6 Find the smallest integer, n , such that $5^n > 800\,000$.
- 7 Sketch each pair of curves on the same diagram, showing the coordinates of any points of intersection with the coordinate axes.
a $y = 2^x$ **b** $y = 3^x$ **c** $y = 4^x$ **d** $y = 2^x$
 $y = 5^x$ $y = (\frac{1}{3})^x$ $y = 4^x - 1$ $y = 2^{x+3}$
- 8 A curve has the equation $y = 2 + a^x$ where a is a constant and $a > 1$.
a Sketch the curve, showing the coordinates of any points of intersection with the coordinate axes and the equations of any asymptotes.
Given also that the curve passes through the point $(3, 29)$,
b find the value of a .

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The diagram shows the curve with equation $y = 2^x - 5$ which intersects the coordinate axes at the points A and B . Find the length AB correct to 3 significant figures.