12.1 Exponential and logarithmic functions

12.1 Exponential functions

1. Properties of the exponential function

(a) Calculate the y-intercept of $y = 4^x$.

(b) If $y = a^x$ passes through (5;32), calculate the value of a.

(c) Calculate the y-intercept of $y = (\frac{1}{2})^x$.

(d) If $y = a^x$ passes through (2;25), calculate the value of a.

(e) If $y = a^x$ passes through (2;16), calculate the value of a.

MEMO

1. Properties of the exponential function [6.7.1]

(a) $y = 4^x$

$x = 0:$

$y = 4^0$

$y = 1$

$\therefore (0;1)$

(b) $y = a^x$

$32 = a^5$

$2^5 = a^5$

$\therefore a = 2$

(c) $y = (\frac{1}{2})^x$

$x = 0:$

$y = (\frac{1}{2})^0$

$y = 1$

$\therefore (0;1)$

(d) $y = a^x$

$25 = a^2$

$5^2 = a^2$

$\therefore a = 5$

(e) $y = a^x$

$16 = a^2$

$4^2 = a^2$

$\therefore a = 4$