

Change each of the following in the index form.

Tukarkan setiap yang berikut dalam bentuk indeks. **PL2**

(a) $\log_2 16 = 4$

(b) $\log_4 64 = 3$

[2 marks / *markah*]

Find the value of **PL3**

Cari nilai bagi

(a) $\log_{10} 8$

(b) $\log_{10} 0.0025$

(c) $\log_{10} \left(\frac{2}{3}\right)^2$

[3 marks / *markah*]

Find the value of **PL3**

Cari nilai bagi

(a) $\log_3 27$

(b) $\log_4 256$

[2 marks / *markah*]

Find the value of each of the following. 

Cari nilai bagi setiap yang berikut.

- (a) antilog 0.2357
- (b) antilog (-0.6218)

[2 marks / *markah*]

Solve the following equations. **PLA**

Selesaikan persamaan yang berikut.

(a) $\log_6 x = 2$

(b) $\log_3 x = 7$

[2 marks / markah]

Find the value of x for each of the following.

Cari nilai x bagi setiap yang berikut. **PL4**

(a) $\log x = 1.2788$

(b) $\log x = -0.3010$

[2 marks / *markah*]

Solve the following equations. **PLA**

Selesaikan persamaan yang berikut.

(a) $10^x = 4$

(b) $5^x = 7$

[2 marks / *markah*]

Find the value of

PL3

Cari nilai bagi

(a) $\ln 1$

(b) $\ln 2.84$

[2 marks / *markah*]

Solve the following equations. 


Selesaikan persamaan yang berikut.

(a) $\ln x = 3.5264$

(b) $\ln x = 2.4849$

[2 marks / *markah*]

Solve the following natural logarithmic equations.

Selesaikan persamaan logaritma jati yang berikut. 

(a) $\ln(3x - 5) = 6$

(b) $4e^{5x-1} = 24$

[4 marks / *markah*]

Simplify **PL3**

Permudahkan

(a) $\log_2 10 - \log_2 6$

(b) $\log 18 - \log 2 - \log 3$ [4 marks / *markah*]

Given $\log_x 9 = 2$, find the value of 

Diberi $\log_x 9 = 2$, cari nilai bagi

(a) x

(b) $\log_9 \left(\frac{1}{x} \right)$

[4 marks / *markah*]

Solve the equation $2^{x-3} = 15^{x-4}$. Give your answer correct to three decimal places. **PL4**

Selesaikan persamaan $2^{x-3} = 15^{x-4}$. Berikan jawapan anda betul kepada tiga tempat perpuluhan.

[3 marks / *markah*]

Solve $\log_2 x - \log_2 (x + 3) = -21$. Give your answer in standard form. **PL4**

Selesaikan $\log_2 x - \log_2 (x + 3) = -21$. Berikan jawapan anda dalam bentuk piawai.

[3 marks / *markah*]

Solve $\log_2 x - \log_2 (x + 3) = -21$. Give your answer in standard form. **PL4**

Selesaikan $\log_2 x - \log_2 (x + 3) = -21$. Berikan jawapan anda dalam bentuk piawai.

[3 marks / markah]

Given that $\log_3 4 = m$ and $\log_3 5 = n$, express $\log_{64} 75$ in terms of m and n . **PL4**

*Diberi bahawa $\log_3 4 = m$ dan $\log_3 5 = n$,
ungkapkan $\log_{64} 75$ dalam sebutan m dan n .*

[3 marks / markah]

Given $x = 2^h$ and $y = 2^k$, express $\log_8 x + \log_4 y$ in terms of h and k . **PL4**

Diberi $x = 2^h$ dan $y = 2^k$, ungkapkan $\log_8 x + \log_4 y$ dalam sebutan h dan k .


[3 marks / markah]

Solve the equation $5^m - 4(3^m) = 0$. Give your answer correct to four significant figures.

Selesaikan persamaan $5^m - 4(3^m) = 0$. Berikan jawapan anda betul kepada empat angka bererti.

PL4

[3 marks / markah]

Solve the equation $\log_5 x = 1 + \log_x 25$. 

Selesaikan persamaan $\log_5 x = 1 + \log_x 25$.


[3 marks / markah]

Solve the logarithmic equation $\log_4 x = \log_{16} 64$.

Selesaikan persamaan logaritma


$\log_4 x = \log_{16} 64$. **PL4**

[3 marks / *markah*]

Solve the following logarithmic equation. 
Selesaikan persamaan logaritma yang berikut.

$$\log_3 p^3 - \log_{27} p = \frac{8}{3}$$

[3 marks / *markah*]

Solve the equation $4^{n+1} = 512 + 2^{2n+1}$. 

Selesaikan persamaan $4^{n+1} = 512 + 2^{2n+1}$.

[3 marks / *markah*]

Find the value of h for 

Cari nilai h bagi

$$5 \log_3 \left(\frac{h}{3} \right) + \log_3 \sqrt{h} = 6.$$

[3 marks / *markah*]

Solve the equation $5(2^{n+2}) = 10 \times 3^{4n^2}$. Find the possible values of n and give your answers correct to four decimal places. **PLA**

Selesaikan persamaan $5(2^{n+2}) = 10 \times 3^{4n^2}$. Cari nilai-nilai n yang mungkin dan berikan jawapan anda betul kepada empat tempat perpuluhan.

[4 marks / markah]

Given that

Diberi bahawa

$$\log 100 - x(4x - 2) = 0$$

Find the value of x if x is a positive number.

Cari nilai x jika x ialah nombor positif. 

[3 marks / markah]

Solve the equation $7^x = 15$. Give your answer correct to three decimal places. **PL4**

Selesaikan persamaan $7^x = 15$. Berikan jawapan anda betul kepada tiga tempat perpuluhan.

[3 marks / markah]

Find the possible values of p for $\log_3 p = \frac{16}{\log_3 p}$.

Cari nilai-nilai p yang mungkin bagi

$$\log_3 p = \frac{16}{\log_3 p} \cdot \text{PL4}$$

[3 marks / *markah*]

Solve the equation **PL4**

Selesaikan persamaan

$$\log(x^2 - 9) - \log(x + 3) = \log 6.$$

[4 marks / *markah*]

It is given that $x = 2^a$ and $y = 4^b$, show that

Diberi $x = 2^a$ dan $y = 4^b$, tunjukkan

$$\log_2 (x^4 y^2) = 4(a + b).$$

[3 marks / *markah*]

Given that $r = \log_a 2$ and $s = \log_a 6$. Express each of the following logarithms in terms of r and s . **PLA**

Diberi bahawa $r = \log_a 2$ dan $s = \log_a 6$.

Ungkapkan setiap logaritma yang berikut dalam sebutan r dan s .

(a) $\log_a 48$

(b) $\log_a 0.375$

[4 marks / *markah*]

Solve the equation $\log_5 (x - 3) = 0$. 

Selesaikan persamaan $\log_5 (x - 3) = 0$.

[3 marks / *markah*]

Solve the following equation by using natural logarithms. **PL4**


Selesaikan persamaan berikut menggunakan logaritma jati.

$$\ln (5x - 1) = 4$$

Give your answer correct to four decimal places.

Berikan jawapan anda betul kepada empat tempat perpuluhan.

[3 marks / markah]

Given that $\log_3 2 = p$ and $\log_3 5 = q$. Express each of the following in terms of p and q . 

Diberi bahawa $\log_3 2 = p$ dan $\log_3 5 = q$.

Ungkapkan setiap berikut dalam sebutan p dan q .

(a) $\log_3 2.5$

(b) $\log_5 50$

[4 marks / *markah*]

Solve the equation $(\sqrt{5})^{3x-1} = 4$. Give your answer correct to four decimal places. ■■■■

Selesaikan persamaan $(\sqrt{5})^{3x-1} = 4$. Berikan jawapan anda betul kepada empat tempat perpuluhan.

[4 marks / markah]

Given that $a = \log_x y^2$ and $b = \log_y x$, show that $ab = 2$. **PL4**

*Diberi bahawa $a = \log_x y^2$ dan $b = \log_y x$,
tunjukkan $ab = 2$.*

[3 marks / markah]

Given $\log_n 2 = p$ and $\log_n 3 = q$, express $\log_3 16n^2$ in terms of p and q . **PL4**

Diberi $\log_n 2 = p$ dan $\log_n 3 = q$, ungkapkan $\log_3 16n^2$ dalam sebutan p dan q .

[3 marks / markah]

Given $\log_x 6 = y$, express in term of y **PL4**

Diberi $\log_x 6 = y$, ungkapkan dalam sebutan y

(a) $\log_x 36$

(b) $\log_6 216x^2$

[4 marks / markah]

Solve **PL4**

Selesaikan

$$\log_p 32 - \log_{\sqrt{p}} 2p = 1$$

[3 marks / *markah*]

(a) Given $A = \log_c B$, state the conditions of c .
Diberi $A = \log_c B$, nyatakan syarat-syarat bagi c . **PL4**

(b) Given $\log_2 y = \frac{5}{\log_{xy} 2}$, express y in terms of x . **PL4**

Diberi $\log_2 y = \frac{5}{\log_{xy} 2}$, ungkapkan y dalam sebutan x .

[4 marks / *markah*]

30. (a) $2^4 = 16$ (b) $4^3 = 64$
 31. (a) 0.9031 (b) -2.6021
 (c) -0.3522
 32. (a) 3 (b) 4
 33. (a) 1.7207 (b) 0.2389
 34. (a) $x = 36$ (b) $x = 2\ 187$
 35. (a) 19 (b) 0.5

36. (a) $x = 0.6021$ (b) $x = 1.2091$
 37. (a) 0 (b) 1.0438
 38. (a) $x = 34$ (b) $x = 12$
 39. (a) $x = 136.1429$ (b) $x = 0.5584$

40. (a) $\log_2 \left(\frac{5}{3} \right)$ (b) $\log 3$

41. (a) 3 (b) $-\frac{1}{2}$

42. $x = 4.344$

43. $x = 1.4305 \times 10^{-6}$

44. $\frac{2n + 1}{3m}$

45. $\frac{2h + 3k}{6}$

46. $m = 2.714$

47. $x = \frac{1}{5}, x = 25$

48. $x = 8$

49. $p = 3$

50. $n = 4$

51. 9

52. $n = 0.4838, n = -0.3260$

53. $x = 1$

54. $x = 1.392$

55. $p = 81, p = \frac{1}{81}$

56. $x = 9$

57. LHS = $\log_2 (x^4 y^2) = 4 \log_2 x + 2 \log_2 y$
 $= 4a + 2(2b) = 4(a + b) = \text{RHS [shown]}$

58. (a) $3r + s$ (b) $s - 4r$

59. $x = 4$

60. $x = 11.1196$

61. (a) $q - p$ (b) $\frac{p + 2q}{q}$

62. $x = 0.9076$

63. $ab = (\log_r y^2)(\log_y x) = \left(\frac{2 \log y}{\log x} \right) \left(\frac{\log x}{\log y} \right) = 2$ [shown]

64. $\frac{4p + 2}{q}$

65. (a) $2y$ (b) $3 + \frac{2}{y}$

66. $p = 2$

67. (a) $c > 0, c \neq 1$ (b) $y = x^{-\frac{5}{4}}$