

Given $\log_5 4 = x$ and $\log_8 80 = y$. Express $\log_4 2$ in terms of x and y .

Diberi $\log_5 4 = x$ dan $\log_8 80 = y$. Ungkapkan $\log_4 2$ dalam sebutan x dan y .

KELANTAN - AGAMA

[4 marks]

[4 markah]

$$\log_4 2 = \frac{3y}{8} - \frac{1}{4x} \quad \text{or} \quad \log_4 2 = \frac{2}{3y} + \frac{1}{3xy}$$

$$\text{B2: } \log_4 2^4 + \log_4 5 = \frac{3y}{2} \quad \text{or} \quad \log_4 (16 \times 5) = \frac{3y}{2}$$

$$\text{B1: } \frac{\log_4 80}{\log_4 8} = y$$

Find the value of x which satisfy the following equation :

Cari nilai x yang memuaskan persamaan berikut :

$$\frac{2}{\log_x xy} + \frac{2}{\log_y xy} + 3 = 5x$$

BPSBP

[4 marks]

[4 markah]

$$x = 1 \text{ or } x = \frac{1}{y}$$

$$\text{B3: } 5 \log_x y + 5 = x(5 \log_x y + 5)$$

$$\text{B2: } 2 + 2 \log_x y + 3 \log_x x + 3 \log_x y = 5x \log_x x + 5x \log_x y$$

$$\text{B1: } \frac{\log x}{\log xy} \text{ or } \frac{\log y}{\log xy}$$

Given that $\log_2 P + \log_4 Q = 6$, express P in terms of Q **MELAKA** [3 marks]

Diberi $\log_2 P + \log_4 Q = 6$, ungkapkan P dalam sebutan Q [3 markah]

$$P = \frac{64}{\sqrt{Q}}$$

B2: $\log_2 P^2 Q = \log_2 4096$ or equivalent

B1: $\log_2 P + \frac{\log_2 Q}{\log_2 2^2} = \log_2 2^6$

Given $\log_x p - \frac{1}{\log_q x^2} = 0$. Express p in term of q .

KELANTAN

Diberi $\log_x p - \frac{1}{\log_q x^2} = 0$. Ungkapkan p dalam sebutan q .

[3 marks]
[3 markah]

$$p = \sqrt{q}$$

B2;

$$\log_x \frac{p^2}{q} = 0$$

B1;

$$\frac{2}{\log_x q}$$

Solve the equations:

Selesaikan persamaan:

KEDAH

a) $27^{-\log_3 y} = 64$

b) $\log_{125} [\log_3 (5x - 7)] = \frac{1}{3}$

[4 marks/markah]

$$\text{a) } 27^{-\log_3 y} = 64$$

$$3^{\log_3 y^{-3}} = 4^3$$

$$y^{-3} = 4^3$$

$$y = \frac{1}{4}$$

$$\text{b) } \log_{125} - [\log_3 (5x - 7)] = \frac{1}{3}$$

$$\log_3 (5x - 7) = 125^{\frac{1}{3}}$$

$$5x - 7 = 3^5$$

$$x = 50$$

Given that $\log_x 8 = 3$, find the value of

Diberi bahawa $\log_x 8 = 3$, cari nilai

(a) x ,

(b) $\log_8 \left(\frac{1}{x} \right)$.

PAHANG

[2 marks]
[2 markah]

6(a)

(b)

$$x = 2$$

$$-\frac{1}{3}$$

Given that $2\log_y x = 8\log_x y$, express x in terms of y .

PERLIS

[3 marks]

Diberi $2\log_y x = 8\log_x y$, ungkapkan x dalam sebutan y .

[3 markah]

$$2 \log_y x = \frac{8}{\log_y x}$$

$$(\log_y x)^2 = 4$$

$$\log_y x = 2$$

$$\log_y x = 2 \log_y y$$

$$\log_y x = \log_y y^2$$

$$\log_y x = 2$$

$$\therefore x = y^2$$

$$x = y^2$$

$$\text{B2 : } \log_y x = 2$$

B1 : Change to base y

$$2 \log_y x = \frac{8}{\log_y x}$$

Solve the equation
Selesaikan persamaan

JOHOR

$$\log_{x^2} 256 - \log_2 x = 3$$

[4 marks/ *markah*]

$$x = 2 \text{ and } x = \frac{1}{16}$$

$$\log_2 x = 1 \text{ or } \log_2 x = -4 \text{ seen}$$

$$\log_2 256 = 8 \text{ or } 2 \log_2 x \text{ OR } 8 \log_2 2 \text{ or } 2 \log_2 x \text{ seen}$$

$$\text{Change base, } \frac{\log_2 256}{\log_2 x^2} - \log_2 x = 3$$

Given $\log_v k = w$ and $\log_k h = p$. Express in terms of p and w .

Diberi $\log_v k = w$ dan $\log_k h = p$. Ungkapkan dalam sebutan p dan w .

a) $\log_v h$

b) $(\log_h k)^{-1}$

[4 marks]

KELANTAN - PPT

[4 markah]

a

pw

B1:

$$\frac{\log_v h}{\log_v k} = p$$

b

p

B1:

$$\frac{1}{\frac{\log_v k}{\log_v h}}$$

Given $\log_5 3 = m$ and $\log_6 45 = n$. Express $\log_3 2$ in terms of m and n .

Diberi $\log_5 3 = m$ dan $\log_6 45 = n$. Ungkapkan $\log_3 2$ dalam sebutan m dan n .

[4 marks]

KELANTAN - PPT

[4 markah]

$$\log_3 2 = \frac{2m+1-mn}{mn}$$

B3:

$$\frac{2 + \frac{1}{m}}{1 + \log_3 2} = n$$

B2:

Given $\log_6 3 = p$, express in terms of p

Diberi $\log_6 3 = p$, ungkapkan dalam sebutan p

(a) $\log_{\frac{1}{9}} \sqrt{6}$,

(b) $\log_6 2$.

TERENGGANU (PERTENGAHAN)
[4 marks]
[4 markah]

$$(a) \quad \frac{1}{4p}$$

$$\log_6 6^{\frac{1}{2}} \text{ and } \log_6 \frac{1}{9}$$

$$(b) \quad 1 - p$$

$$\log_6 \left(\frac{6}{3} \right)$$

(a) Given $x = \frac{1}{m^3}$, find

Diberi $x = \frac{1}{m^3}$, cari

PERAK

(i) $\log_m x$,

(ii) $2 \log_x m$

[3 marks/markah]

(b) Given $\log_y 7 = n$, express in terms of n

Diberi $\log_y 7 = n$, ungkapkan dalam sebutan n

(i) $\log_y 49y$,

(ii) $\log_7 343y^2$.

[4 marks/markah]

(c) Solve the equation

Selesaikan persamaan

$$\log_5 3 + \log_5 (x - 4) = 1$$

[3 marks/markah]

(ii) $1 + \log_3 (x - 3) = \log_3 x$

[6 marks/markah]

(a) Given $\log_p 3 = m$ and $\log_p 5 = n$. express $\log_5 27p^2$ in terms of m and n .
Diberi $\log_p 3 = m$ dan $\log_p 5 = n$, ungkapkan $\log_5 27p^2$ dalam sebutan m dan n .
[3 marks/markah]

(b) Given $\log_x 9 = 2$. find the value of
Diberi $\log_x 9 = 2$, cari nilai

PERAK

(i) x

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

[3 marks/markah]

13.

a) i) -3 ii) $-\frac{2}{3}$

b) i) $2n + 1$ ii) $3 + \frac{2}{n}$

c) $x = \frac{17}{3}$

14.

ii) $x = \frac{9}{2}$

15.

a) $\frac{3m+2}{n}$

b) i) $x = 3$ ii) $-\frac{1}{2}$

(a) (i) Given $K = \log_x L$, state the conditions of x .
Diberi $K = \log_x L$, nyatakan syarat-syarat bagi x .

[1 marks/1 markah]

(ii) Given $\log_3 p = \frac{2}{\log_{pq} 3}$, express p in terms of q .
Diberi $\log_3 p = \frac{2}{\log_{pq} 3}$, ungkapkan p dalam sebutan q .

[3 marks/3 markah]

PERAK

(c) Given $2^x + 2^x = 2^y$, express x in terms of y .
Diberi $2^x + 2^x = 2^y$, ungkapkan x dalam sebutan y .

[3 marks/3 markah]

a) i) $x > 0, x \neq 1$

ii) $p = \frac{1}{q^2}$

c) $x = y - 1$

Given $\log_m u^2 v = x$ and $\log_m \frac{v}{u} = y$, express $\log_m uv$ in terms of x and/or y .

Diberi $\log_m u^2 v = x$ dan $\log_m \frac{v}{u} = y$, ungkapkan $\log_m uv$ dalam sebutan x

dan/atau y .

Answer/ Jawapan:

NEGERI SEMBILAN

[4 marks]

[4 markah]

$$\frac{2x+y}{3}$$

$$\log_m v = \frac{x+2y}{3} \text{ or } \log_m u = \frac{x-y}{3} \text{ OR } \left(\frac{x+2y}{3} + \frac{x-y}{3} \right)$$

$$\log_m v = x - 2(\log_m v - y) \text{ or } \log_m u = x - 2\log_m u - y$$

$$\log_m v = x - 2\log_m u \text{ OR } \log_m u = \log_m v - y$$

Given that $2 \log_3 y = 4 - \log_{27} x^2$, express x in terms of y . TERENGGANU

[4 marks]

Diberi bahawa $2 \log_3 y = 4 - \log_{27} x^2$, ungkapkan x dalam sebutan y .

[4 markah]

$$x = \frac{729}{y^3}$$

4

$$x^2 y^6 = 3^{12}$$

B3

$$\log_3 x^2 y^6 = 12$$

B2

$$\log_3 y^2 = 4 - \frac{\log_3 x^2}{\log_3 27} \text{ (use law and change base of logarithm)}$$

B1

Given that $\log_2 b = x$ and $\log_{\sqrt{2}} c = y$. Express $\log_8 \frac{256c^2}{b^4}$ in terms of x and y .

[4 marks]

Diberi bahawa $\log_2 b = x$ dan $\log_{\sqrt{2}} c = y$. Ungkapkan $\log_8 \frac{256c^2}{b^4}$ dalam sebutan x dan y .

PULAU PINANG

[4 markah]

$$\frac{8 + y - 4x}{3}$$

$$B3 : \frac{8}{3} + \log_8 2^y - \log_8 2^{4x}$$

$$B2 : \log_8 256c^2 - \log_8 b^4$$

$$B1 : b = 2^x \quad \text{or} \quad c = \sqrt{2}^y$$

Given $\log_a b = m$ and $b(a^{2x}) = \sqrt[3]{b}$, express x in terms of m .

Diberi $\log_a b = m$ dan $b(a^{2x}) = \sqrt[3]{b}$ ungkapkan x dalam dalam sebutan m .

KELANTAN

[3 marks]
[3 markah]

$$x = -\frac{m}{3}$$

B2;

$$2x = \log_a b^{-\frac{2}{3}}$$

B1;

$$a^{2x} = b^{-\frac{2}{3}}$$

Solve the equation

Selesaikan persamaan

JOHOR

$$8^{\log_2 x} = 3$$

[2 marks/ *markah*]

$$x = \sqrt[3]{3}$$

$$\frac{\log_2 3}{3} \text{ or } \log_2 3^{\frac{1}{3}} \text{ seen}$$

Given $\log_a b = m$ and $b(a^{2x}) = \sqrt[3]{b}$, express x in terms of m .

Diberi $\log_a b = m$ dan $b(a^{2x}) = \sqrt[3]{b}$ ungkapkan x dalam dalam sebutan m .

KELANTAN

[3 marks]
[3 markah]

$$x = -\frac{m}{3}$$

B2;

$$2x = \log_a b^{-\frac{2}{3}}$$

B1;

$$a^{2x} = b^{-\frac{2}{3}}$$

Given that $5^x = p$ and $5^y = q$. Express $\log_{25} \frac{p^2}{5}$ in terms of x and y .

Diberi bahawa $5^x = p$ dan $5^y = q$. Ungkapkan $\log_{25} \frac{p^2}{5}$ dalam sebutan x dan y .

[3 marks]

[3 markah]

Given that $5^x = p$ and $5^y = q$. Express $\log_{25} \frac{p^2}{5}$ in terms of x and y .

Diberi bahawa $5^x = p$ dan $5^y = q$. Ungkapkan $\log_{25} \frac{p^2}{5}$ dalam sebutan x dan y .

KELANTAN (AGAMA)

[3 marks]

[3 markah]

$$x - \frac{1}{2}$$

$$B2: \frac{(2x-1) \log_5 5}{2}$$

$$B1: \log_{25} \frac{5^{2x}}{5} \text{ or } \log_{25} 5^{2x-1}$$

Solve the equation :

Selesaikan persamaan :

$$\log_x 128 - \log_{\sqrt{x}} 2x = 3$$

[3 marks]

SELANGOR

[3 markah]

Given that $\log_2 m = 2x$ and $\log_4 n = y - 3$. Express the following in terms of x and y .

Diberi bahawa $\log_2 m = 2x$ dan $\log_4 n = y - 3$. Ungkapkan yang berikut dalam sebutan x dan y .

(a) $\log_2 4mn$

(b) $\log_m n$

PULAU PINANG SET 1

[3 marks / 3 markah]

Answer / Jawapan :

$$\begin{aligned}
 \text{(a)} \quad &= \log_2 2^2 + \log_2 m + \log_2 n \\
 &= 2 \log_2 2 + 2x + \frac{\log_4 n}{\log_4 2} \\
 &= 2 + 2x + \frac{y - 3}{\log_4 4^{\frac{1}{2}}} \\
 &= 2 + 2x + 2(y - 3) \\
 &= 2x + 2y - 4
 \end{aligned}$$

$$\begin{aligned}
 \text{(b)} \quad &= \frac{\log_2 n}{\log_2 m} \\
 &= \frac{2(y - 3)}{2x} \\
 &= \frac{y - 3}{x}
 \end{aligned}$$