

Jawapan

Praktis 4

Praktis Formatif

$$1 \quad \frac{27^{n+1}}{9^n \times 3^{2-n}} \\ = \frac{3^{3n+3}}{3^{3n+3}} \\ = \frac{3^{2n} \times 3^{2-n}}{3^{3n+3}} \\ = \frac{3^{3n+3}}{3^{3n+3}} \\ = 3^{2n+1}$$

$$2 \quad (a) \quad \frac{(6a^3b)^2}{3a^4b^{-2}} \\ = \frac{36a^6b^2}{3a^4b^{-2}} \\ = 12a^2b^4$$

$$(b) \quad \left(2h^{-1}k^6\right)^{\frac{1}{3}} \times \sqrt{25h^2k^5} \\ = 8h^{-3}k^2 \times 5hk^{\frac{5}{2}} \\ = 40h^{-2}k^3$$

$$3 \quad (a) \quad 3^{5-m} = \frac{3^5}{3^m} \\ = \frac{243}{y}$$

$$(b) \quad 8^{m+1} - 18^m = 8^m \times 8 - (2 \times 9)^m \\ = 8(2^{3m}) - 2^m \times (3^2)^m \\ = 8(2^m)^3 - 2^m \times (3^m)^2 \\ = 8x^3 - xy^2$$

$$4 \quad 3^{n+2} - 5(3^n) + 3^{n-1} \\ = 3^n \times 3^2 - 5(3^n) + \frac{3^n}{3}$$

$$= 3^n \left[3^2 - 5 + \frac{1}{3} \right]$$

$$= 3^n \left[4\frac{1}{3} \right]$$

$$= 3^n \left(\frac{13}{3} \right)$$

$$= 13 \left(\frac{3^n}{3} \right)$$

$$= 13(3^{n-1})$$

13 ialah satu faktor, \therefore ia boleh dibahagi tepat dengan 13.

13 is a factor, \therefore it is divisible by 13.

$$5 \quad (a) \quad 2^{3-x} = \frac{1}{16} \\ = 2^{-4}$$

$$3 - x = -4$$

$$x = 7$$

$$(b) \quad 6^{2x-1} + 180 = 6^{2x} \\ \frac{6^{2x}}{6} + 180 = 6^{2x}$$

Biar/Let $6^{2x} = ut$

$$\frac{u}{6} + 180 = u$$

$$\frac{5}{6}u = 180$$

$$u = 216$$

$$6^{2x} = 216$$

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

$$2x = 3$$

$$x = \frac{3}{2}$$

$$6 \quad 3^x = 81^y$$

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

$$x = 4y \dots \textcircled{1}$$

$$\frac{4^x}{32^y} = 8$$

$$\frac{2^{2x}}{2^{5y}} = 2^3$$

$$2^{2x-5y} = 2^3$$

$$2x - 5y = 3 \dots \textcircled{2}$$

Gantikan $\textcircled{2}$ ke dalam $\textcircled{1}$, /Substitute $\textcircled{1}$ into $\textcircled{2}$,

$$2(4y) - 5y = 3$$

$$3y = 3$$

$$y = 1$$

Apabila/When $y = 1$, $x = 4(1)$

$$x = 4$$

$$7 \quad (a) \quad \sqrt{14} \times \sqrt{63}$$

$$= \sqrt{2 \times 7} \times \sqrt{7 \times 9}$$

$$= \sqrt{2 \times 7 \times 7 \times 9}$$

$$= \sqrt{2 \times 7^2 \times 3^2}$$

$$= 7 \times 3\sqrt{2}$$

$$= 21\sqrt{2}$$

$$(b) \quad \frac{\sqrt{48}}{\sqrt{50}}$$

$$= \sqrt{\frac{48}{50}}$$

$$= \sqrt{\frac{24}{25}}$$

$$= \sqrt{\frac{4 \times 6}{25}}$$

$$= \frac{2}{5}\sqrt{6}$$

$$8 \quad (a) \quad \frac{5\sqrt{2} + 6}{\sqrt{2}}$$

$$= 5 + \frac{6}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$$

$$= 5 + \frac{6}{2}\sqrt{2}$$

$$= 5 + 3\sqrt{2}$$

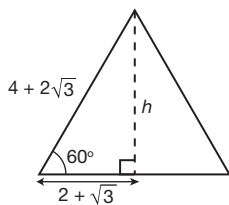
$$\begin{aligned}
 \text{(b)} \quad & \frac{\sqrt{12}}{\sqrt{5}-\sqrt{3}} \\
 &= \frac{2\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} \\
 &= \frac{2\sqrt{3} \times (\sqrt{5}+\sqrt{3})}{5-3} \\
 &= \frac{\sqrt{15}+3}{2} \\
 &= 3 + \frac{\sqrt{15}}{2}
 \end{aligned}$$

$$\begin{aligned}
 9 \quad & (1-2\sqrt{5})^2 - \frac{4\sqrt{5}}{3+\sqrt{5}} \\
 &= (1-4\sqrt{5}+4(5)) - \left(\frac{4\sqrt{5}}{3+\sqrt{5}} \times \frac{3-\sqrt{5}}{3-\sqrt{5}} \right) \\
 &= (21-4\sqrt{5}) - \left(\frac{4\sqrt{5}(3-\sqrt{5})}{9-5} \right) \\
 &= 21-4\sqrt{5}-3\sqrt{5}+5 \\
 &= 26-7\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 10 \quad & \frac{(1-3\sqrt{7})^2}{3-\sqrt{7}} \\
 &= \frac{1-6\sqrt{7}+9(7)}{3-\sqrt{7}} \\
 &= \frac{64-6\sqrt{7}}{3-\sqrt{7}} \times \frac{3+\sqrt{7}}{3+\sqrt{7}} \\
 &= \frac{192+46\sqrt{7}-42}{9-7} \\
 &= \frac{150+46\sqrt{7}}{2} \\
 &= 75+23\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 11 \quad & 2\sqrt{2}x-4=3x-5\sqrt{2} \\
 & 2\sqrt{2}x-3x=4-5\sqrt{2} \\
 & x(2\sqrt{2}-3)=4-5\sqrt{2} \\
 & x=\frac{4-5\sqrt{2}}{2\sqrt{2}-3} \times \frac{2\sqrt{2}+3}{2\sqrt{2}+3} \\
 & x=\frac{8\sqrt{2}+12-10(2)-15\sqrt{2}}{4(2)-9} \\
 & x=\frac{-8-7\sqrt{2}}{-1} \\
 & x=8+7\sqrt{2}
 \end{aligned}$$

12 (a)



$$\tan 60^\circ = \frac{h}{2+\sqrt{3}}$$

$$\sqrt{3} = \frac{h}{2+\sqrt{3}}$$

$$h = 3 + 2\sqrt{3} \text{ cm}$$

$$\begin{aligned}
 \text{(b) Luas/Area} &= \frac{1}{2} \times (4+2\sqrt{3}) \times (3+2\sqrt{3}) \\
 &= (2+\sqrt{3})(3+2\sqrt{3}) \\
 &= 6+7\sqrt{3}+2(3) \\
 &= 12+7\sqrt{3} \text{ cm}^2
 \end{aligned}$$

$$13 \text{ (a) } \log_3 5 = n$$

$$3^n = 5$$

$$\begin{aligned}
 \text{(b) } 9^{n+1} &= 9^n \times 9^1 \\
 &= 3^{2n} \times 9 \\
 &= (3^n)^2 \times 9 \\
 &= (5)^2 \times 9 \\
 &= 225
 \end{aligned}$$

$$\begin{aligned}
 14 \text{ (a) } \log_2 1.2 &= \log_2 \frac{6}{5} \\
 &= \log_2 \frac{2 \times 3}{5} \\
 &= \log_2 2 + \log_2 3 - \log_2 5 \\
 &= 1 + m - n
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } \log_8 75 &= \frac{\log_2 75}{\log_2 8} \\
 &= \frac{\log_2 (3 \times 25)}{3 \log_2 2} \\
 &= \frac{\log_2 3 + \log_2 5^2}{3} \\
 &= \frac{\log_2 3 + 2 \log_2 5}{3} \\
 &= \frac{m + 2n}{3}
 \end{aligned}$$

$$\begin{aligned}
 15 \text{ (a) } 2 \log_4 y + 6 \log_4 x &= 1 \\
 \log_4 y^2 + \log_4 x^6 &= \log_4 4 \\
 \log_4 (y^2 x^6) &= \log_4 4 \\
 y^2 x^6 &= 4 \\
 y x^3 &= 2 \\
 y &= \frac{2}{x^3}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } \log_9 y &= 2 - \log_3 x \\
 \frac{\log_3 y}{\log_3 9} &= 2 \log_3 3 - \log_3 x \\
 \frac{\log_3 y}{2} &= \log_3 9 - \log_3 x \\
 \frac{1}{2} \log_3 y &= \log_3 \frac{9}{x} \\
 \log_3 \sqrt{y} &= \log_3 \frac{9}{x} \\
 \sqrt{y} &= \frac{9}{x} \\
 y &= \frac{81}{x^2}
 \end{aligned}$$

$$\begin{aligned}
 16 \text{ (a) } 5^{x+2} &= 8 \\
 \lg 5^{x+2} &= \lg 8 \\
 (x+2)\lg 5 &= \lg 8 \\
 (x+2)\lg 5 &= \lg 8 \\
 x+2 &= \frac{\lg 8}{\lg 5} - 2 \\
 x &= -0.7080
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } 2^x \cdot 3^x &= 7^{x+1} \\
 (2 \times 3)^x &= 7^x \times 7^1 \\
 \frac{6^x}{7^x} &= 7 \\
 \lg \left(\frac{6}{7} \right)^x &= \lg 7 \\
 x \lg \frac{6}{7} &= \lg 7 \\
 x &= -12.62
 \end{aligned}$$

17 (a) $2 \ln(4x - 5) = 1$
 $\ln(4x - 5) = \frac{1}{2}$
 $4x - 5 = e^{\frac{1}{2}}$
 $4x = 5 + e^{\frac{1}{2}}$
 $x = \frac{5 + e^{\frac{1}{2}}}{4}$
 $x = 1.662$

(b) $\log_5 10x = \log_5(x - 3) + 2$
 $= \log_5(x - 3) + 2 \log_5 5$
 $= \log_5(x - 3) + \log_5 25$
 $= \log_5 25(x - 3)$
 $10x = 25(x - 3)$
 $\div 5, 2x = 5(x - 3)$
 $2x = 5x - 15$
 $3x = 15$
 $x = 5$

18 (a) $\log_x 6 + \log_x 3 = 2 - \log_x 2$
 $\log_x 6 + \log_x 3 = 2 \log_x x - \log_x 2$
 $\log_x(6 \times 3) = \log_x x^2 - \log_x 2$
 $\log_x 18 = \log_x \left(\frac{x^2}{2}\right)$
 $18 = \frac{x^2}{2}$
 $x^2 = 36$
 $x = 6 (x > 0)$

(b) $\log_2 y - \log_4 3y = 1$
 $\log_2 y - \frac{\log_2 3y}{\log_2 4} = 1$
 $\log_2 y - \frac{\log_2 3y}{2} = \log_2 2$
 $\times 2, 2 \log_2 y - \log_2 3y = 2 \log_2 2$
 $\log_2 \frac{y^2}{3y} = \log_2 4$
 $\frac{y}{3} = 4$
 $y = 12$

19 (a) $P = 25b^t$
Diberi/Given $t = 2, P = 27,$
 $27 = 25b^2$
 $b^2 = \frac{27}{25}$
 $b^2 = \sqrt{\frac{27}{25}}$
 $b = 1.04$

(b) $t = 8, P = 25(1.04)^8$
 $= 34 \text{ juta/million}$

(c) $25(1.04)^t > 40$
 $(1.04)^t > 1.6$
 $\lg(1.04)^t > \lg 1.6$
 $t \lg(1.04) > \lg 1.6$
 $t > 11.98$
 $t = 12$
Tahun/Year 2022

20 (a) $N = N_0 e^{-kt}$
 $\frac{1}{4} N_0 = N_0 e^{-k(28)}$
 $e^{-28k} = \frac{1}{4}$
 $-28k = \ln \frac{1}{4}$
 $k = 0.05$

(b) $\frac{1}{10} N_0 = N_0 e^{-0.05t}$
 $e^{-0.05t} = \frac{1}{10}$
 $-0.05t = \ln \frac{1}{10}$
 $t = 46 \text{ hari/days}$

Praktis Sumatif

Kertas 1

1 $\log_p 56 = \log_p (8 \times 7)$
 $= \log_p 8 + \log_p 7$
 $= 3 \log_p 2 + \log_p 7$
 $= \frac{3}{\log_2 p} + \frac{1}{\log_7 p}$
 $= \frac{3}{x} + \frac{1}{y}$

2 (a) $6^{2 - \log_6 5} = \frac{6^2}{6^{\log_6 5}}$
 $= \frac{36}{5}$
 $= 7.2$

(b) $e^{2x-3} = 5$
 $2x - 3 = \ln 5$
 $x = \frac{3 + \ln 5}{2}$
 $x = 2.305$

3 (a) $5^{y+1} = 4(5^y) + 625^x$
 $5(5^y) = 4(5^y) + 5^{4x}$
 $5^y = 5^{4x}$
 $y = 4x$

(b) $\log_9[\log_2(5x - 2)] = \frac{1}{2}$
 $\log_2(5x - 2) = 9^{\frac{1}{2}}$
 $\log_2(5x - 2) = 3$
 $5x - 2 = 2^3$
 $5x - 2 = 8$
 $5x = 10$
 $x = 2$

4 (a) $(a + 2\sqrt{5})^2 = 29 + b\sqrt{5}$
 $a^2 + 4a\sqrt{5} + 20 = 29 + b\sqrt{5}$
Bandingkan integer/Compare integer:
 $a^2 + 20 = 29$
 $a^2 = 9$
 $a = 3$
Bandingkan pekali bagi $\sqrt{5}$:
Compare the coefficient of $\sqrt{5}$.

$$\begin{aligned} b &= 4a \\ &= 4(3) \\ &= 12 \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad & \frac{\log_{36} 16 \times \log_4 125}{\log_6 25} \\ &= \frac{\log_2 16}{\log_2 36} \times \frac{\log_2 125}{\log_2 4} \\ &= \frac{\log_2 25}{\log_2 6} \\ &= \frac{\log_2 16}{\log_2 36} \times \frac{\log_2 125}{\log_2 4} \times \frac{\log_2 6}{\log_2 25} \\ &= \frac{\log_2 4^2}{\log_2 6^2} \times \frac{\log_2 5^3}{\log_2 4} \times \frac{\log_2 6}{\log_2 5^2} \\ &= \frac{3}{2} \end{aligned}$$

$$\begin{aligned} \text{5 (a)} \quad & \frac{7^{2n+1} - 5(49^n)}{343^n (7^{1-n})} \\ &= \frac{7^{2n} \times 7 - 5(7^{2n})}{7^{3n} (7^{1-n})} \\ &= \frac{7^{2n} (7 - 5)}{7^{3n+1-n}} \\ &= \frac{7^{2n} (2)}{7^{2n} \times 7} \\ &= \frac{2}{7} \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad p + q\sqrt{2} &= \left(\frac{3}{1-\sqrt{2}} \right)^2 \\ &= \frac{9}{1-2\sqrt{2}+2} \\ &= \frac{9}{3-2\sqrt{2}} \\ &= \frac{9}{3-2\sqrt{2}} \times \frac{3+2\sqrt{2}}{3+2\sqrt{2}} \\ &= \frac{27+18\sqrt{2}}{9-8} \\ &= 27+18\sqrt{2} \end{aligned}$$

$$p = 27, q = 18$$

$$\text{6 (a)} \quad 3^x - 15(3^{-x}) = 2$$

$$3^x - \frac{15}{3^x} = 2$$

$$\text{Biar/Let } 3^x = u$$

$$u - \frac{15}{u} = 2$$

$$\times u, u^2 - 15 = 2u$$

$$u^2 - 2u - 15 = 0$$

$$(u+3)(u-5) = 0$$

$$u > 0, u = 5$$

$$3^x = 5$$

$$\lg 3^x = \lg 5$$

$$x \lg 3 = \lg 5$$

$$x = 1.465$$

$$\begin{aligned} \text{(b)} \quad \log_5 p^3 q &= 2 + \log_{125} q - \log_5 p \\ &= 2 + \frac{\log_5 q}{\log_5 125} - \log_5 p \\ &= 2 + \frac{\log_5 q}{3} - \log_5 p \\ &\times 3, 3 \log_5 p^3 q = 6 + \log_5 q - 3 \log_5 p \end{aligned}$$

$$\log_5 (p^3 q)^3 = 6 \log_5 5 + \log_5 q - 3 \log_5 p$$

$$\log_5 p^9 q^3 = \log_5 \frac{5^6 q}{p^3}$$

$$p^9 q^3 = \frac{5^6 q}{p^3}$$

$$q^2 = \frac{5^6}{p^{12}}$$

$$q = \frac{5^3}{p^6}$$

$$q = \frac{125}{p^6}$$

Kertas 2

$$\text{1 (a)} \quad k = \frac{\frac{2}{\sqrt{3}} - 1}{\frac{2}{\sqrt{3}} + 1} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$k = \frac{2 - \sqrt{3}}{2 + \sqrt{3}}$$

$$k = \frac{2 - \sqrt{3}}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$$

$$k = \frac{(2 - \sqrt{3})^2}{4 - 3}$$

$$k = 4 - 4\sqrt{3} + 3$$

$$k = 7 - 4\sqrt{3}$$

$$\text{(b)} \quad k - \frac{1}{k} = 7 - 4\sqrt{3} - \frac{1}{7 - 4\sqrt{3}}$$

$$= 7 - 4\sqrt{3} - \frac{1}{7 - 4\sqrt{3}} \times \frac{7 + 4\sqrt{3}}{7 + 4\sqrt{3}}$$

$$= 7 - 4\sqrt{3} - \frac{7 + 4\sqrt{3}}{49 - 16(3)}$$

$$= 7 - 4\sqrt{3} - (7 + 4\sqrt{3})$$

$$= -8\sqrt{3}$$

$$\text{2 (a)} \quad 2^{x+1} - 2^{x-1} = 2^x \cdot 2^1 - \frac{2^x}{2}$$

$$= 2^x \left(2 - \frac{1}{2} \right)$$

$$= 3 \left(\frac{2^x}{2} \right)$$

$$= 3(2^{x-1})$$

$$k = 3$$

$$\text{(b)} \quad 3(2^{x-1}) = 6(2^{-x})^x$$

$$2^{x-1} = 2(2^{-x^2})$$

$$2^{x-1} = 2^{1-x^2}$$

$$x-1 = 1-x^2$$

$$x^2 + x - 2 = 0$$

$$(x-1)(x+2) = 0$$

$$x = 1, x = -2$$

$$\text{3 (a)} \quad 1 + \log_{27}(2x+5)^3 - 2 \log_3 x$$

$$= 1 + \frac{\log_3(2x+5)^3}{\log_3 27} - 2 \log_3 x$$

$$= \log_3 3 + \frac{\log_3(2x+5)^3}{3} - 2 \log_3 x$$

$$= \log_3 3 + \log_3 (2x+5) - \log_3 x^2$$

$$= \log_3 \frac{3(2x+5)}{x^2} \text{ atau/or } \log_3 \left(\frac{6x+15}{x^2} \right)$$

$$(b) 1 + \log_{27}(2x + 5)^3 - 2 \log_3 x = 2$$

$$\log_3 \left(\frac{6x + 15}{x^2} \right) = 2$$

$$\frac{6x + 15}{x^2} = 3^2$$

$$6x + 15 = 9x^2$$

$$\div 3, 2x + 5 = 3x^2$$

$$3x^2 - 2x - 5 = 0$$

$$(3x - 5)(x + 1) = 0$$

$$x > 0, x = \frac{5}{3}$$

$$4 \quad a = 3^m \Rightarrow \log_3 a = m$$

$$b = 3^n \Rightarrow \log_3 b = n$$

$$(a) \log_3 \frac{81a}{b^2} = \log_3 81 + \log_3 a - \log_3 b^2$$

$$= 4 \log_3 3 + \log_3 a - 2 \log_3 b$$

$$= 4 + m - 2n$$

$$(b) \log_{\sqrt{ab}} 27 = \frac{\log_3 27}{\log_3 \sqrt{ab}}$$

$$= \frac{3}{\frac{1}{2} \log_3 ab}$$

$$= \frac{6}{\log_3 a + \log_3 b}$$

$$= \frac{6}{m + n}$$

$$5 \quad (a) AE = \sqrt{4^2 - 3^2}$$

$$= \sqrt{7}$$

$$\frac{1}{2}(3 + EC + 3 + 2\sqrt{7})(\sqrt{7}) = 21 + 2\sqrt{7}$$

$$\frac{1}{2}(EC + 6 + 2\sqrt{7})(\sqrt{7}) = 21 + 2\sqrt{7}$$

$$EC + 6 + 2\sqrt{7} = \frac{2(21 + 2\sqrt{7})}{\sqrt{7}}$$

$$= \frac{42}{\sqrt{7}} + 4$$

$$= \frac{42}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} + 4$$

$$= \frac{42\sqrt{7}}{7} + 4$$

$$= 4 + 6\sqrt{7}$$

$$EC = -2 + 4\sqrt{7}$$

$$(b) \text{Biar } BF = \text{jarak serenjang dari } B \text{ ke } EC$$

Let $BF = \text{perpendicular distance from } B \text{ to } EC$

$$FC = -2 + 4\sqrt{7} - (3 + 2\sqrt{7})$$

$$FC = -5 + 2\sqrt{7}$$

$$BF = AE = \sqrt{7}$$

$$BC^2 = FC^2 + AE^2$$

$$BC^2 = (-5 + 2\sqrt{7})^2 + (\sqrt{7})^2$$

$$= 25 - 20\sqrt{7} + 4(7) + 7$$

$$= 60 - 20\sqrt{7}$$

$$6 \quad (a) \quad (i) (2 - \sqrt{3})^2 = 4 - 4\sqrt{3} + 3$$

$$= 7 - 4\sqrt{3}$$

$$(ii) \frac{4 - 2\sqrt{3}}{5 - 3\sqrt{3}} = \frac{4 - 2\sqrt{3}}{5 - 3\sqrt{3}} \times \frac{5 + 3\sqrt{3}}{5 + 3\sqrt{3}}$$

$$= \frac{20 + 2\sqrt{3} - 6(3)}{25 - 27}$$

$$= \frac{2 + 2\sqrt{3}}{-2}$$

$$= -1 - \sqrt{3}$$

$$(b) a(2 - \sqrt{3})^2 + b \left(\frac{4 - 2\sqrt{3}}{5 - 3\sqrt{3}} \right) = 9 - 13\sqrt{3}$$

$$a(7 - 4\sqrt{3}) + b(-1 - \sqrt{3}) = 9 - 13\sqrt{3}$$

$$7a - b + (-4a - b)\sqrt{3} = 9 - 13\sqrt{3}$$

$$7a - b = 9 \dots \textcircled{1}$$

$$4a + b = 13 \dots \textcircled{2}$$

$$\textcircled{1} + \textcircled{2}, 11a = 22$$

$$a = 2$$

Gantikan ke dalam $\textcircled{2}$ /Substitute into $\textcircled{2}$,

$$4(2) + b = 13$$

$$b = 5$$

$$7 \quad (a) \quad (i) \sqrt{5^y} = \frac{5^x}{25}$$

$$5^{\frac{1}{2}y} = \frac{5^x}{5^2}$$

$$5^{\frac{1}{2}y} = 5^{x-2}$$

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

$$y = 2x - 4 \dots \textcircled{1}$$

$$(ii) \log_2 y = 1 + 2 \log_2 (x - 2)$$

$$\log_2 y = \log_2 2 + 2 \log_2 (x - 2)$$

$$\log_2 y = \log_2 2 + \log_2 (x - 2)^2$$

$$\log_2 y = \log_2 2(x - 2)^2$$

$$y = 2(x - 2)^2$$

$$y = 2(x - 2)^2 \dots \textcircled{2}$$

$$(b) \text{Gantikan } \textcircled{1} \text{ ke dalam } \textcircled{2}/\text{Substitute } \textcircled{1} \text{ into } \textcircled{2},$$

$$2x - 4 = 2(x - 2)^2$$

$$x - 2 = x^2 - 4x + 4$$

$$x^2 - 5x + 6 = 0$$

$$(x - 2)(x - 3) = 0$$

$$x = 2, x = 3$$

Gantikan ke dalam $\textcircled{1}$ /Substitute into $\textcircled{1}$,

$$x = 2, y = 2(2) - 4$$

$$y = 0 \text{ (Tidak sah/Invalid)}$$

$$x = 3, y = 2(3) - 4$$

$$y = 2$$

$$8 \quad (a) LHS = \log_{25} \frac{x^2}{y}$$

$$= \frac{\log_5 \frac{x^2}{y}}{\log_5 25}$$

$$= \frac{2 \log_5 x - \log_5 y}{2 \log_5 5}$$

$$= \frac{2 \log_5 x - \log_5 y}{2}$$

$$= \log_5 x - \frac{1}{2} \log_5 y$$

$$= RHS \text{ (tertunjuk/shown)}$$

$$(b) \log_{25} \frac{x^2}{y} = 3$$

$$\log_5 x - \frac{1}{2} \log_5 y = 3 \dots \textcircled{1}$$

$$\log_5 x = 2$$

$$\frac{\log_5 x}{\log_5 y} = 2$$

$$\log_5 x = 2 \log_5 y \dots \textcircled{2}$$

Gantikan $\textcircled{2}$ ke dalam $\textcircled{1}$ /Substitute $\textcircled{2}$ into $\textcircled{1}$,

$$2 \log_5 y - \frac{1}{2} \log_5 y = 3$$

$$\frac{3}{2} \log_5 y = 3$$

$$\log_5 y = 2 \dots \textcircled{3}$$

$$y = 5^2$$

$$y = 25$$

Gantikan $\textcircled{3}$ ke dalam $\textcircled{2}$ /Substitute $\textcircled{3}$ into $\textcircled{2}$,

$$\log_5 x = 2(2)$$

$$\log_5 x = 4$$

$$x = 5^4$$

$$x = 625$$