

Seminar Addmath

Sabtu
17/1/21

A+ Mastery Vol.3

Triks

Indeks

- 2 → genap
- 3 → ganjil
- 5 → akhir '5'
125, 25, 625

Special Case

↳ KUBADATATO

Log

- $\log_{10} 8 \rightarrow \log_{10} 2^3$
- $\log_{10} 27 \rightarrow \log_{10} 3^3$
- $\log_{10} 25 \rightarrow \log_{10} 5^2$

Ciri² Log

Surd

- 2 → genap = $\sqrt{2} = \sqrt{2} \times \sqrt{2}$
- 3 → ganjil = $\sqrt[3]{27} = \sqrt[3]{9 \times 3} = 3\sqrt[3]{3}$
- 5 → $\sqrt{125} = \sqrt{25 \times 5} = 5\sqrt{5}$

Soalan

1) $\log_x x+3 + \log_x (x-1) = 2$

$$\log_x [(x+3)(x-1)] = 2$$

$$\log_x [x^2 + 2x - 3] = 2$$

$$x^2 + 2x - 3 = x^2$$

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

$$2x - 3 = 0$$

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

2) $\log_4 r = \log_{16} 400$

$$\log_4 r = \log_{4^2} \sqrt{400}$$

$$\log_4 r = \log_4 20$$

$$r = 20$$

$$\log_4 r = \frac{\log_4 400}{\log_4 16}$$

$$\log_4 r = \frac{\log_4 400}{\log_4 4^2}$$

@ $\log_4 r = \frac{\log_4 400}{2 \log_4 4 (1)}$

$$\log_4 r = \frac{1}{2} \log_4 400$$

$$\log_4 r = \log_4 \sqrt{400}$$

$$\log_4 r = \log_4 20$$

$$r = 20$$

3) $\log_2 (4x-8) \cdot 3 + \log_2 2x = 2x$

$$\log_2 (4x-8) - \log_2 2x = 3$$

$$\log_2 \left[\frac{4x-8}{2x} \right] = 3$$

$$\frac{4x-8}{2x} = 2^3$$

$$\frac{4x-8}{2x} = 8$$

$$4x-8 = 8(2x)$$

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

4) $2 \log_3 (xy) = 2 + \log_3 x + \log_3 y$

$$2 \log_3 (xy) - \log_3 x - \log_3 y = 2$$

$$\log_3 (xy)^2 - \log_3 x - \log_3 y = 2$$

$$\log_3 \left[\frac{(xy)^2}{xy} \right] = 2$$

$$(xy)^2 \times xy = 3^2$$

$$\log_3 (xy)^2 = 2 + \log_3 (xy) \rightarrow \log_3 x + \log_3 y$$

$$\log_3 \left[\frac{(xy)^2}{xy} \right] = 2$$

$$(xy)^2 = 9$$

$$(xy)^2 = 9xy$$

$$xy^2 = 7xy$$

$$5) \log_3 x - 3 \log_3 27 = 0$$

$$\log_3 x - \log_3 27^3 = 0$$

$$\log_3 x = \log_3 27^3 = 0$$

$$(\log_3 x)^2 - \log_3 (3^3)^2 = 0$$

$$\log_3 x^2 = \log_3 3 + \log_3 3$$

$$x^2 = 3 + 3$$

$$x = \sqrt{6}$$

$$x = 3, x = 3$$

$$6) \log_3 x = \log_3 (5x+6)$$

$$\log_3 x = \frac{\log_3 (5x+6)}{\log_3 3^2}$$

$$\log_3 x = \frac{\log_3 (5x+6)}{2}$$

$$\log_3 x = \frac{1}{2} \log_3 (5x+6)$$

$$\log_3 x = \log_3 (5x+6)^{\frac{1}{2}}$$

$$x = \sqrt{5x+6}$$

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

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

$$x = 6, x = -1$$

$$\log_3 x = \log_3 \sqrt{5x+6}$$

$$\log_3 x = \log_3 \sqrt{5x+6}$$

$$x = \sqrt{5x+6}$$

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

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

$$x = 6, x = -1$$

$$7) \log_3 m = \frac{1}{4}$$

$$m = 3^{\frac{1}{4}}$$

$$m = \sqrt[4]{3}$$

$$m = 3$$

$$8) \log_m 9 = 0.706$$

$$\text{Tunjukkan } \log_m 3m^2 = 2.353$$

$$\log_m (3m^2) = 2.353$$

$$\log_m 3 + \log_m m^2 = 2.353$$

$$\log_m 3 + 2 \log_m m = 2.353$$

$$0.353 + 2 = 2.353$$

$$2.353 = 2.353$$

$$\log_m 9 = 0.706$$

$$\log_m 3^2 = 0.706$$

$$2 \log_m 3 = 0.706$$

$$\log_m 3 = \frac{0.706}{2}$$

$$\log_m 3 = 0.353$$

$$9) 2 \log_2 (x+15) - \log_2 x = 6$$

$$\text{Tunjuk } x^2 - 34x + 225 = 0$$

$$\log_2 (x+15)^2 - \log_2 x = 6$$

$$\log_2 \left[\frac{(x+15)^2}{x} \right] = 6$$

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

$$(x+15)^2 = 64x$$

$$x^2 + 30x + 225 = 64x$$

$$x^2 + 30x - 64x + 225 = 0$$

$$x^2 - 34x + 225 = 0$$

$$b) x^2 - 34x + 225 = 0$$

$$(x-9)(x-25) = 0$$

$$x = 9, x = 25$$

$$11) \log_2 (x-3) = 2$$

$$x-3 = 4$$

$$x = 7$$

$$10) \log_3 2 = 0.631$$

$$\log_3 5 = 1.465$$

$$a) \log_3 1.5 = \log_3 \left(\frac{3}{2} \right)$$

$$= \log_3 3 - \log_3 2$$

$$= 1 - 0.631$$

$$= 0.369$$

$$b) \log_3 50 = \frac{\log_3 50}{\log_3 5}$$

$$= \frac{\log_3 (5 \times 10)}{\log_3 5}$$

$$= \frac{\log_3 (5 \times 5 \times 2)}{\log_3 5}$$

$$= \frac{\log_3 50}{\log_3 5}$$

$$= 2.4307$$

$$3\sqrt{2x} + 5\sqrt{2x} - \sqrt{82x}$$

$$= 3\sqrt{2x} + 5\sqrt{4}\sqrt{2x} - \sqrt{16}\sqrt{2x}$$

$$= 3\sqrt{2x} + 5(2)\sqrt{2x} - 4\sqrt{2x}$$

$$= 3\sqrt{2x} + 10\sqrt{2x} - 4\sqrt{2x}$$

$$= 9\sqrt{2x}$$

$$14) \frac{5}{\sqrt{3}+2} \times \frac{\sqrt{3}-2}{\sqrt{3}-2}$$

$$\frac{5(\sqrt{3}-2)}{(\sqrt{3}+2)(\sqrt{3}-2)}$$

$$\frac{5\sqrt{3}-10}{3+2\sqrt{3}-2\sqrt{3}-4}$$

$$= \frac{5\sqrt{3}-10}{-1}$$

$$= -5\sqrt{3}-10$$

$$17) \frac{3\sqrt{3}-\sqrt{5}}{2\sqrt{3}-\sqrt{5}} \cdot \frac{(2\sqrt{3}+\sqrt{5})}{(2\sqrt{3}+\sqrt{5})}$$

$$= \frac{6(3) + 3\sqrt{3}\sqrt{5} - 2\sqrt{3}\sqrt{5} - 5}{4(3) + 2\sqrt{3}\sqrt{5} - 2\sqrt{3}\sqrt{5} - 5}$$

$$= \frac{18 + \sqrt{3}\sqrt{5} - 5}{12 - 5}$$

$$= \frac{13 + \sqrt{3 \times 5}}{7}$$

$$= \frac{13 + \sqrt{15}}{7}$$

12) Miribahkan penyebut

$$\frac{21\sqrt{2}}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} \quad \text{konjugat}$$

$$\frac{21(\sqrt{2})(\sqrt{7})}{7}$$

$$\frac{21\sqrt{2 \times 7}}{7}$$

$$\frac{21\sqrt{14}}{7}$$

$$= 3\sqrt{14}$$

$$15) \frac{\sqrt{8}}{\sqrt{5}-\sqrt{2}} \times \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}+\sqrt{2}}$$

$$\frac{\sqrt{8}(\sqrt{5}+\sqrt{2})}{(\sqrt{5}-\sqrt{2})(\sqrt{5}+\sqrt{2})}$$

$$= \frac{\sqrt{8}\sqrt{5} + \sqrt{8}\sqrt{2}}{5 + \sqrt{5}\sqrt{2} - \sqrt{5}\sqrt{2} - 2}$$

$$= \frac{\sqrt{2}\sqrt{4}\sqrt{5} + \sqrt{2}\sqrt{4}\sqrt{2}}{5-2}$$

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

$$= \frac{2\sqrt{10} + 4}{3}$$

$$13) \frac{4\sqrt{2}}{\sqrt{3}} (\sqrt{2}-\sqrt{3})$$

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

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

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

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

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

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

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

$$16) \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} \cdot \frac{(\sqrt{3}-\sqrt{2})}{(\sqrt{3}-\sqrt{2})}$$

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

$$= \frac{3 - 2\sqrt{3}\sqrt{2} + 2}{1}$$

$$= \frac{5 - 2\sqrt{5 \times 2}}{1}$$

$$= 5 - 2\sqrt{10}$$

Konjugat
 samakan
 pembawa

Trigonometri

$\cos \theta$	$\operatorname{cosec} \theta = \frac{1}{\sin \theta}$
$\sin \theta$	$\sec \theta = \frac{1}{\cos \theta}$
$\tan \theta$	$\cot \theta = \frac{1}{\tan \theta}$
Basic	

1) $\cot \theta + \tan \theta = \operatorname{cosec} \theta \sec \theta$

$$\frac{1}{\tan \theta} + \tan \theta = \frac{1}{\sin \theta} \times \frac{1}{\cos \theta}$$

$$\frac{\cos \theta \times \frac{1}{\cos \theta} + \frac{\sin \theta \times \sin \theta}{\cos \theta}}{\sin \theta \times \frac{1}{\cos \theta}} = \frac{1}{\sin \theta \cos \theta}$$

amakan penyebut

$$\frac{\cos^2 \theta + \sin^2 \theta}{\sin \theta \cos \theta} = \frac{1}{\sin \theta \cos \theta}$$

$\tan \theta = \frac{\sin \theta}{\cos \theta}$

$\cos^2 \theta + \sin^2 \theta = 1$

$$\frac{1}{\sin \theta \cos \theta} = \frac{1}{\sin \theta \cos \theta}$$

2) $\frac{1 + \sin \pi}{\cos \pi} + \frac{\cos \pi}{1 + \sin \pi} = 2 \sec \pi \left[2 \left(\frac{1}{\cos \pi} \right) \right]$

tukar

$$\frac{1 + \sin \pi (1 + \sin \pi)}{\cos \pi \times (1 + \sin \pi)} = 2 \sec \pi$$

$$\frac{1 + \sin \pi + \sin \pi + \sin^2 \pi + \cos^2 \pi}{\cos \pi + \cos \pi + \sin \pi} = 2 \sec \pi$$

$$\frac{1 + 2 \sin \pi + 1}{\cos \pi (1 + \sin \pi)} \text{ faktorkan}$$

$$\frac{2 + 2 \sin \pi}{\cos \pi (1 + \sin \pi)} = \frac{2}{\cos \pi}$$

$$\frac{2(1 + \sin \pi)}{\cos \pi (1 + \sin \pi)} = \frac{2}{\cos \pi}$$

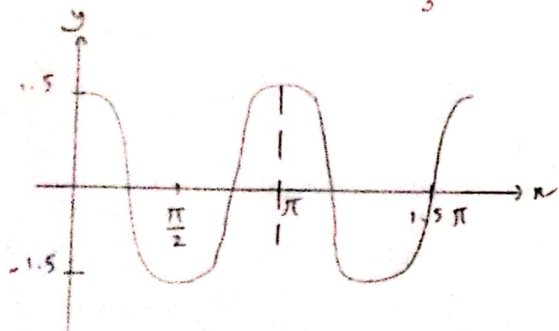
$$\frac{2}{\cos \pi} = \frac{2}{\cos \pi}$$

$$2 \sec \pi = 2 \sec \pi$$

2019

a) sketch graph of $y = \left(\frac{3}{2}\right) \cos 2x$ for $0 \leq x \leq \left(\frac{3}{2}\right) \pi$

$$y = \frac{3}{2} \cos 2x, \quad 0 \leq x \leq \frac{3}{2} \pi$$



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

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

b) sketch a suitable straight line to find the number or solutions to the equation

$$\left(\frac{4}{3}\pi\right)x - \cos 2x = \left(\frac{2}{3}\right) \text{ for } 0 \leq x \leq \frac{3}{2}\pi$$

$$y = \frac{2x}{\pi} - \frac{9}{4}$$

$$\frac{4}{3}\pi x - \cos 2x = \frac{2}{3} \quad \frac{12x}{3\pi} - \frac{9}{4} = 2y$$

$$\frac{4x}{3\pi} - \frac{2y}{3} = \frac{2}{3} \quad \frac{12x}{6\pi} - \frac{9}{4} = y$$

$$\frac{4x}{3\pi} - \frac{3}{2} = \frac{2y}{3} \quad \frac{2x}{\pi} - \frac{9}{4} = y$$