

SOAL PERSIAPAN USBN

1. Jika $\frac{1}{{}^2\log x + {}^4\log y} = 4$ maka $x^2y = \dots$

Pembahasan:

$$\begin{aligned}\frac{1}{{}^2\log x + {}^4\log y} &= \frac{1}{{}^2\log \dots + {}^2\log y^{\dots}} = 4 \\ \frac{1}{{}^2\log(\dots \times \dots^{\dots})} &= 4 \\ 4 \cdot {}^2\log(\dots \times \sqrt{\dots}) &= 1 \\ 4 \cdot {}^2\log(\dots \times \sqrt{\dots}) &= {}^2\log \dots \\ {}^2\log(\dots \times \sqrt{\dots})^{\dots} &= {}^2\log \dots \\ (\dots \sqrt{\dots})^{\dots} &= 2 \\ x^4y^{\dots} &= 2 \\ x^2 \dots &= \sqrt{\dots}\end{aligned}$$

2. $\lim_{x \rightarrow \infty} [\sqrt{x^2 + 6x - 6} - \sqrt{x^2 - 14x - 8}] = \dots$

Pembahasan:

$$\begin{aligned}\lim_{x \rightarrow \infty} [\sqrt{x^2 + 6x - 6} - \sqrt{x^2 - 14x - 8}] &\cdot \frac{\sqrt{x^2 + 6x - 6} \dots \sqrt{x^2 - 14x - 8}}{\sqrt{x^2 + 6x - 6} \dots \sqrt{x^2 - 14x - 8}} \\ \lim_{x \rightarrow \infty} \frac{x^2 + \dots - \dots - (x^2 - \dots - \dots)}{\sqrt{x^2 + 6x - 6} + \sqrt{x^2 - 14x - 8}} \\ &\quad \dots + \dots \\ \lim_{x \rightarrow \infty} \frac{\dots x + 2}{\sqrt{x^2 + 6x - 6} + \sqrt{x^2 - 14x - 8}} \\ \lim_{x \rightarrow \infty} \frac{\frac{\dots x}{x^{\dots}} + \frac{2}{x^{\dots}}}{\sqrt{\frac{x^2}{x^{\dots}} + \frac{6x}{x^{\dots}} - \frac{6}{x^{\dots}}} + \sqrt{\frac{x^2}{x^{\dots}} - \frac{14x}{x^{\dots}} - \frac{8}{x^{\dots}}}}\end{aligned}$$

$$\frac{\dots + \dots}{\sqrt{\dots + \dots + \dots} + \sqrt{\dots + \dots + \dots}} = \frac{\dots}{\dots} = \dots$$

3. Jika suku banyak $f(x)$ dibagi $(x-1)$ bersisa 2 dan $f(x)$ dibagi dengan $(x+2)$ bersisa -1, maka sisa dari $f(x)$ dibagi $(x-1)(x+2)$ adalah....

Pembahasan:

$$f(x) : (x-1) \rightarrow f(1) = \dots$$

$$f(x) : (x+2) \rightarrow f(\dots) = \dots$$

$$f(x) : (x-1)(x+2) \rightarrow f(x) = (x+a)(x+b)H(x) + ax + b$$

$$f(x) = (x-1)(x+2)H(x) + ax + b$$

$$f(\dots) = (\dots-1)(\dots+2)H(\dots) + a(\dots) + b$$

$$f(\dots) = a + b$$

$$\dots = a + b \quad \dots \text{Pers 1}$$

$$f(\dots) = (\dots-1)(\dots+2)H(\dots) + a(\dots) + b$$

$$f(\dots) = \dots a + b$$

$$\dots = \dots a + b \quad \dots \text{Pers 2}$$

Eliminasi (1) dan (2)

Substitusi a

$$a + b = \dots$$

$$a + b = \dots$$

$$\dots a + b = \dots$$

$$\dots + b = \dots$$

$$\dots a = \dots$$

$$b = \dots$$

Maka $s(x) = ax + b = \dots + \dots$

4. Diketahui bahwa $|\vec{a}| = \sqrt{3}$, $|\vec{b}| = 1$ dan $|\vec{a} - \vec{b}| = 1$, panjang vektor $(\vec{a} + \vec{b})$ adalah

Pembahasan:

$$|\vec{a} + \vec{b}| = \sqrt{a^2 + b^2 + 2ab\cos\alpha}$$

$$|\vec{a} - \vec{b}| = \sqrt{a^2 + b^2 - 2ab\cos\alpha}$$

$$|\vec{a} - \vec{b}|^2 = a^2 + b^2 - 2ab\cos\alpha$$

$$(\dots)^2 = (\sqrt{\dots})^2 + (\dots)^2 - 2(\sqrt{\dots})(\dots)\cos\alpha$$

$$\dots = \dots + \dots - 2\sqrt{\dots}\cos\alpha$$

$$2\sqrt{\dots} \cos \alpha = \dots + \dots - \dots$$

$$2\sqrt{\dots} \cos \alpha = \dots$$

$$\cos \alpha = \frac{\dots}{\dots\sqrt{\dots}} = \frac{\dots}{2} \sqrt{\dots}$$

Maka,

$$|\bar{a} + \bar{b}| = \sqrt{\dots + \dots + 2\sqrt{\dots}(\dots)\frac{\dots}{\dots}\sqrt{\dots}}$$

$$|a + b| = \sqrt{\dots + \dots + \dots}$$

$$|a + b| = \sqrt{\dots}$$