

Pembahasan  
Latihan Soal  
UN SMA/MA

Matematika

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Latihan Soal

Mata Pelajaran

Matematika

Program IPA

Oleh Team [Unisma.com](http://Unisma.com)

# 1

## Pembahasan Soal

Disusun oleh : Team [unsma.com](http://unsma.com)

Team [unsma.com](http://unsma.com) memandu siswa/siswi untuk memperoleh kesuksesan dalam ujian nasional. Kunjungi <http://unsma.com> untuk mendapat materi pelatihan soal UN 2016. Dapatkan akses untuk mendapatkan latihan dan prediksi soal dalam bentuk ebook (pdf) yang bisa didownload di member area apabila akun Anda sudah kami aktifkan.

1. **Jawab : A**

**Pembahasan :**

x = bunga

p = berbau harum

q = daunnya hijau

Ingkaran dari " Ada bunga yang tidak harum atau daunnya tidak hijau"

$$= \sim \exists x, (\sim p \vee \sim q)$$

$$= \forall x, \sim (\sim p \vee \sim q)$$

$$= \forall x, (p \wedge q)$$

= Semua bunga harum baunya dan hijau daunnya

2. **Jawab : C**

**Pembahasan :**

$$x^2 - 18x + 3m + 12 = 0$$

$$\alpha = 5\beta$$

$$\alpha + \beta = -\frac{b}{a} = 18$$

$$5\beta + \beta = 18$$

$$6\beta = 18 \rightarrow \beta = 3$$

Diperoleh  $\alpha = 5\beta = 15$

$$\alpha\beta = \frac{c}{a} = 3m + 12$$

$$15 \cdot 3 = 3m + 12$$

$$m = 11$$

3. **Jawab : D**

**Pembahasan :**

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

$$p + q = 6 \quad pq = 2$$

$$x_1 = 3p - 1 \quad x_2 = 3q - 1$$

$$\begin{aligned} x_1 + x_2 &= 3(p + q) - 2 \\ &= 3 \cdot 6 - 2 \\ &= 16 \end{aligned}$$

$$\begin{aligned} x_1 \cdot x_2 &= (3p - 1)(3q - 1) \\ &= 9pq - 3(p + q) + 1 \\ &= 18 - 18 + 1 \\ &= 1 \end{aligned}$$

$$x^2 - (x_1 + x_2)x + x_1x_2 = 0$$

$$x^2 - 16x + 1 = 0$$

4. **Jawab B**

**Pembahasan :**

$${}^{27}\log 5 = p \Rightarrow {}^{3^3}\log 5 = p$$

$$\Rightarrow \frac{1}{3} {}^3\log 5 = p$$

$$\Rightarrow {}^3\log 5 = 3p$$

$$\begin{aligned} {}^{25}\log 3 + {}^{243}\log \sqrt{5} &= {}^{5^2}\log 3 + {}^{3^5}\log 5^{\frac{1}{2}} \\ &= \frac{1}{2} {}^5\log 3 + \frac{1}{5} \cdot \frac{1}{2} {}^3\log 5 \\ &= \frac{1}{2} \cdot \frac{1}{3p} + \frac{1}{10} \cdot 3p \\ &= \frac{1}{6p} + \frac{3p}{10} \end{aligned}$$

5. **Jawab : A**

**Pembahasan :**

substitusi  $y = x^2 + x + p$  ke  $3x + y = 1$ , diperoleh

$$3x + x^2 + x + p = 1$$

$$x^2 + 4x + p - 1 = 0$$

Kedua grafik bersinggungan

$$D = 0$$

$$16 - 4p + 4 = 0$$

$$p = 5$$

6. **Jawab C**

**Pembahasan :**

$$V = 100\sqrt{3}$$

$$L_{\text{alas}} \times \text{tinggi} = 100\sqrt{3}$$

$$L_{\text{alas}} \cdot 10 = 100\sqrt{3}$$

$$L_{\text{alas}} = 10\sqrt{3}$$

$$\frac{1}{2} \cdot 5 \cdot 8 \sin A = 10\sqrt{3}$$

$$\sin A = \frac{1}{2}\sqrt{3}$$

$$\cos A = \frac{1}{2}$$

$$BC^2 = AB^2 + AC^2 - 2AB \cdot AC \cdot \cos A$$

$$= 5^2 + 8^2 - 2 \cdot 5 \cdot 8 \cdot \cos 60^\circ$$

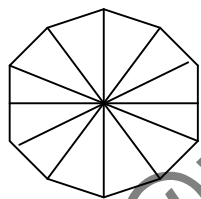
$$= 25 + 64 - 40$$

$$= 49$$

$$BC = 7$$

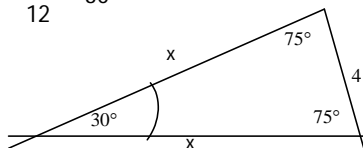
7. **Jawab : A**

**Pembahasan :**



Jika kita ambil salah satu juring pada segi 12 beraturan, maka sudut pada juring tersebut adalah

$$\frac{360^\circ}{12} = 30^\circ$$



Dengan menggunakan Aturan sin

$$\frac{x}{\sin 75^\circ} = \frac{4}{\sin 30^\circ}$$

$$\frac{x}{\sin(45^\circ + 30^\circ)} = \frac{4}{\frac{1}{2}}$$

$$\frac{x}{\sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ} = 8$$

$$x = 8 \cdot \left( \frac{1}{2}\sqrt{2} \cdot \frac{1}{2}\sqrt{3} + \frac{1}{2}\sqrt{2} \cdot \frac{1}{2} \right) = 2(\sqrt{6} + \sqrt{2})$$

Luas Juring yang berbentuk segitiga tersebut adalah

$$L = \frac{1}{2} \cdot x \cdot x \cdot \sin 30^\circ$$

$$= \frac{1}{2} \cdot 4(\sqrt{6} + \sqrt{2})^2 \cdot \frac{1}{2}$$

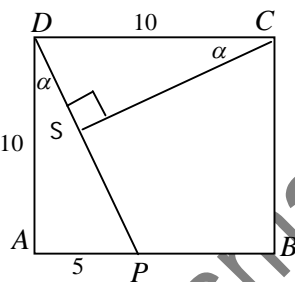
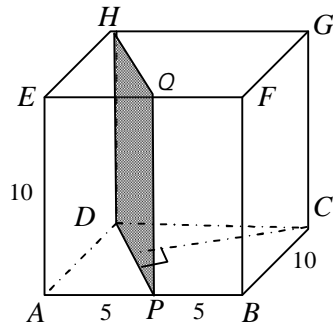
$$= 8 + 2\sqrt{12}$$

$$= 8 + 4\sqrt{3}$$

$$\text{Luas segi 12} = 96 + 48\sqrt{3}$$

8. **Jawab : B**

**Pembahasan :**



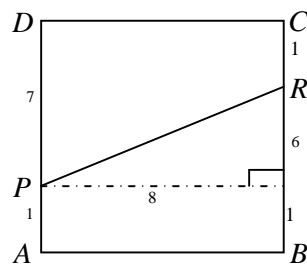
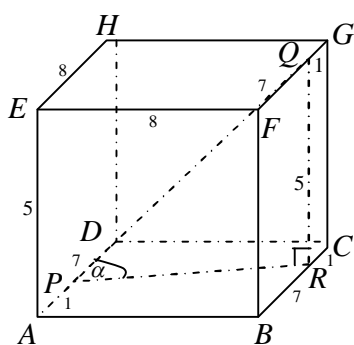
$$\cos \alpha = \frac{AD}{DP} = \frac{CS}{DC}$$

$$\frac{10}{5\sqrt{5}} = \frac{DS}{10}$$

$$CS = \frac{20}{\sqrt{5}} = 4\sqrt{5} \text{ cm}$$

9. **Jawab : C**

**Pembahasan :**



$$PR = \sqrt{8^2 + 6^2} = 10$$

$$\tan \alpha = \frac{QR}{PR} = \frac{5}{10} = \frac{1}{2}$$

10. **Jawab B**

**Pembahasan :**

$$3 \cos 2x - 14 \sin x + 9 = 0$$

$$3(1 - 2 \sin^2 x) - 14 \sin x + 9 = 0$$

$$-6 \sin^2 x - 14 \sin x + 12 = 0$$

$$3 \sin^2 x + 7 \sin x - 6 = 0$$

$$3y^2 + 7y - 6 = 0$$

$$(3y - 2)(y + 3) = 0$$

$$y = \frac{2}{3} \text{ atau } y = -3$$

$$\sin x = \frac{2}{3} \text{ atau } \sin x = -3$$

Karena nilai  $-1 \leq \sin x \leq 1$ , berarti yang memenuhi  $\sin x = \frac{2}{3}$

11. **Jawab: C**

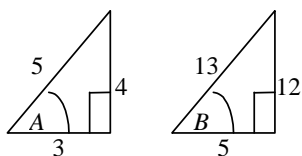
Jari-jari lingkaran adalah jarak titik P (-4,1) terhadap garis  $4y - 3x - 1 = 0$

$$R = \frac{|4y_1 - 3x_1 - 1|}{\sqrt{8^2 + 6^2}} = \frac{|4(1) - 3(-4) - 1|}{5} = 3$$

$$\text{Jadi, } L = \pi r^2 = \pi \cdot 3^2 = 9\pi$$

12. **Jawab : A**

Diketahui  $\sin A = \frac{4}{5}$  dan  $\sin B = \frac{12}{13}$



$$A + B + C = 180^\circ$$

$$C = 180^\circ - (A + B)$$

$$\sin C = \sin[180^\circ - (A + B)]$$

$$= \sin(A + B)$$

$$= \sin A \cos B + \cos A \sin B$$

$$= \frac{4}{5} \cdot \frac{5}{13} + \frac{3}{5} \cdot \frac{12}{13}$$

$$= \frac{20}{65} + \frac{36}{65} = \frac{56}{65}$$

13. **Jawab:**

**Pembahasan :**

$$\frac{\cos 74^\circ + \cos 46^\circ}{2 \sin 38^\circ \cos 38^\circ}$$

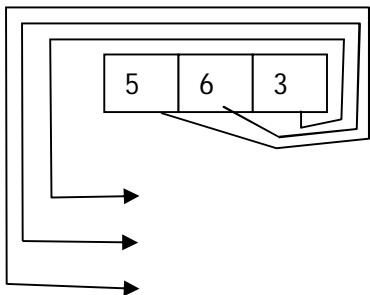
$$\begin{aligned}
&= \frac{2 \cos\left(\frac{74^\circ + 46^\circ}{2}\right) \cos\left(\frac{74^\circ - 46^\circ}{2}\right)}{\sin(2 \cdot 38^\circ)} \\
&= \frac{2 \cos 60^\circ \cos 14^\circ}{\sin 76^\circ} \\
&= \frac{2 \cdot \frac{1}{2} \cdot \cos 14^\circ}{\sin(90^\circ - 14^\circ)} \\
&= \frac{\cos 14^\circ}{\cos 14^\circ} \\
&= 1
\end{aligned}$$

14. **Jawab : C**  
**Pembahasan :**

| Nilai i | Frekuensi i |                                    |
|---------|-------------|------------------------------------|
| 51 - 60 | 5           | $\rightarrow d_1 = 8 - 5 = 3$      |
| 61 - 70 | 8           | $\rightarrow tb = 61 - 0,5 = 60,5$ |
| 71 - 80 | 3           | $\rightarrow d_2 = 8 - 3 = 5$      |

$$\begin{aligned}
M_o &= tb + \left(\frac{d_1}{d_1 + d_2}\right) i \\
&= 60,5 + \left(\frac{3}{3+5}\right) 10 \\
&= 60,5 + 3,75 = 64,25
\end{aligned}$$

15. **Jawab:**  
**Pembahasan :**



Agar bilangan itu ganjil Susun dulu satuannya , ada 3 cara, yaitu 3, 5, atau 7

Karena 1 angka sudah diambil, maka tersisa 6 angka lagi

Karena 2 angka sudah diambil, maka tersisa 5 angka lagi

Jadi : ada  $5 \cdot 6 \cdot 3 = 90$  bilangan