Latihan Soal Dan Pembahasan

Mata Ujian : Matematika

Latihan untuk Sipencatar :

STPI Curug

@Sipencatar.com

Untuk Persiapan Ujian Tulis

Oleh Team Sipencatar.com

Pembahasan Soal

Disusun oleh : Team Sipencatar.com

1. **Jawab B**
   Pembahasan :

   fungsi kuadrat memotong sumbu X di (–4,0) & (3,0)

   $$y = a(x - x_1)(x - x_2)$$

   $$y = a(x - 3)(x + 4)$$

   Melalui (0, –12)

   $$-12 = a(0 - 3)(0 + 4)$$

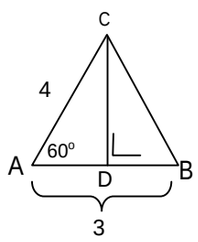
   $$-12 = -12a$$

   $$a = 1$$

   $$y = 1 \cdot (x - 3)(x + 4)$$

   $$y = x^2 + x - 12$$

2. **Jawab E**
   Pembahasan :



$\sin 60^o = \frac{CD}{AC}$

$CD = AC \cdot \sin 60^o$

$= 4 \cdot \frac{1}{2}\sqrt{3}$

$= 2\sqrt{3}$

3. **Jawab E**
   Pembahasan :

Berat Badan	f	f kumulatif
50 – 52	4	4
53 – 55	5	9

Kelas median: Pada urutan ke $\frac{1}{2}n$ = ke-10

Berarti kelas interval 56 – 58

Tb = tepi bawah = 55,5

C = panjang interval kelas = (52 – 50) + 1 = 3

f_{kumseb} = frekuensi kumulatif kelas sebelumnya = 9

$$\text{Median} = Tb + c\ \frac{\frac{1}{2}n - f_{kumseb}}{f_{kelas}}$$

$$= 55{,}5 + 3 \cdot \frac{10 - 9}{3}$$

$$= 56{,}5$$

4. Jawab:

Tinggi badan	f	Kode
150–154	3	–2
155–159	6	–1
160–164	9	0
165–169	8	1
170–174	4	2

$\overline{X_s}$ = Rata-rata sementara

= tengah-tengah kelas yang kodenya 0

= 162

$$\overline{X_{kode}} = \frac{-6-6+0+8+8}{3+6+9+8+4} = \frac{4}{30} = \frac{2}{15}$$

Rata-rata = $\overline{X_s} + c\ \overline{X_{kode}}$

$$= 162 + 5 \cdot \frac{2}{15}$$

$$= 162{,}7$$

5. **Jawab D**
Pembahasan :

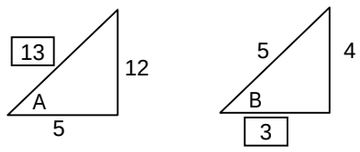
$$\text{Peluang} = \frac{\text{Banyak kejadian}}{\text{semesta}} = \frac{C_3^7 \cdot C_1^5}{C_4^{12}}$$

$$= \frac{\frac{7!}{4! \cdot 3!} \cdot \frac{5!}{4! \cdot 1!}}{\frac{12!}{8! \cdot 4!}} = \frac{\frac{7 \cdot \cancel{6} \cdot 5 \cdot \cancel{4!}}{\cancel{4!} \cdot \cancel{3} \cdot \cancel{2} \cdot 1} \cdot \frac{5}{1!}}{\frac{\cancel{12} \cdot 11 \cdot 10 \cdot 9 \cdot \cancel{8!}}{\cancel{8!} \cdot \cancel{4} \cdot \cancel{3} \cdot 2 \cdot 1}}$$

$$= \frac{\frac{7 \cdot 5 \cdot 5}{11 \cdot 10 \cdot 9}}{2} = \frac{35}{99}$$

6. **Jawab A**
Pembahasan :

$$\text{tg } A = \frac{12}{5} \qquad \sin B = \frac{4}{5}$$



Nilai $\cos(A - B) = \cos A \cos B + \sin A \sin B$

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

$$= \frac{63}{65}$$

7. **Jawab A**
Pembahasan :

$$\frac{\sin 81^o + \sin 21^o}{\sin 69^o - \sin 171^o} = \frac{2\sin(\frac{81+21}{2}) \cdot \cos(\frac{81-21}{2})}{2\cos(\frac{69+171}{2}) \cdot \sin(\frac{69-171}{2})}$$

$$= \frac{2\sin(51) \cdot \cos(30)}{2\cos(120) \cdot \sin(-51)}$$

$$= \frac{2\sin(51) \cdot \frac{1}{2}\sqrt{3}\cos(30)}{2 \cdot (-\frac{1}{2}) \cdot (-\sin(51))}$$

$$= \sqrt{3}$$

8. **Jawab B**
Pembahasan :

$$\sin x^o - \sqrt{3}\cos x^o = 1$$

$$k\cos(x-\alpha) = 1$$

Dengan: $k = \sqrt{(-\sqrt{3})^2 + 1^2} = 2$

$$\text{tg}\alpha = \frac{\sin}{\cos} = \frac{1}{-\sqrt{3}} = -\frac{1}{3}\sqrt{3}$$

sin positif } $\Rightarrow$ Kuadran II $\Rightarrow \alpha = 150$
cos negatif

Diperoleh: $2\cos(x-150) = 1$

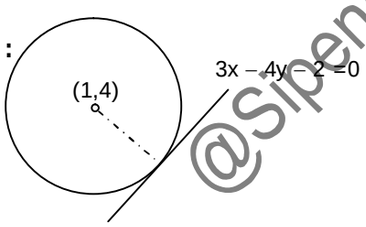
$$\cos(x-150) = \frac{1}{2}$$

$$\cos(x-150) = \cos 60$$

$$x - 150 = \pm 60 + k\,360$$

$x = 90 + k\,360$ ||| $x = 210 + k\,360$

9. **Jawab D**
Pembahasan :



Jari-jari R = Jarak titik (1, 4) ke garis $3x - 4y - 2 = 0$

$$= \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$$

$$= \frac{|3\cdot 1 - 4\cdot 4 - 2|}{\sqrt{3^2 + (-4)^2}}$$

$$= \frac{15}{5} = 3$$

Persamaan lingkaran: $(x - x_p)^2 + (y - x_p)^2 = R^2$

$$(x-1)^2 + (y-4)^2 = 3^2$$

$$x^2 - 2x + 1 + y^2 - 8y + 16 = 9$$

$$x^2 + y^2 - 2x - 8y + 8 = 0$$

10. **Jawab D**
Pembahasan :

$f(x) = 2x^2 - 2$ dan $g(x) = \frac{1}{2}x + 2$

$(f \circ g)(x) = f(g(x))$

$= g(\frac{1}{2}x + 2)$

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

$= 2(\frac{1}{4}x^2 + 2x + 4) - 2$

$= \frac{1}{2}x^2 + 4x + 6$