# PEMBAHASAN SBMPTN 2016 TKD SAINTEK
# MATEMATIKA IPA (KODE NASKAH : 237)

Pembahas : Drs. H. Heru Seno & Drs. H. Muchayat

1. Jawaban : B

   Pembahasan:

   BE = x $\rightarrow$ DE - x = CE + x

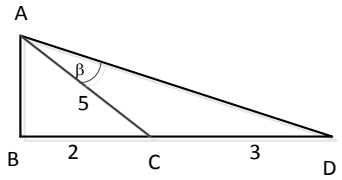
   10 - x = 8 + x

   2 = 2x $\rightarrow$ x = 1

   AD = CB = 8 + 1 = 9

2. Jawaban : D

   Pembahasan:




   $CD^2 = AC^2 + AD^2 - 2\ AC\ .\ AD \cos B$

   $9 = 5 + 26 - 2\sqrt{130} \cos B \rightarrow Cos\ B = \frac{11}{\sqrt{130}}$

   $\rightarrow \cos^2 B = \frac{121}{130}$

3. Jawaban : E

   Pembahasan:

   $Cos^4 2x - 4 \left[1 - \cos^2 2x\right]^2 = 1$

   $3\ Cos^4 2x - 8 \cos^2 2x + 5 = 0$

   $\left[3\cos^2 2x - 5\right] - \left[\cos^2 2x - 1\right] = 0$

   $Cos^2 2x = 1$

   Cos 2x = 1 atau cos 2x = -1

   X = 0, $\pi$, $2\pi$ x = $\pi/2, \frac{3}{2}\pi$

4. Jawaban : D

   Pembahasan:

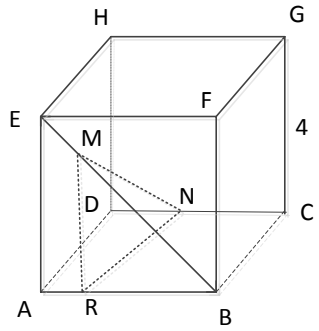
   $V = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} a \\ b \end{pmatrix}$

   $= \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} a \\ b \end{pmatrix} \rightarrow V = \begin{pmatrix} -a \\ b \end{pmatrix}$

   $u + v = \begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} -a \\ b \end{pmatrix} = \begin{pmatrix} 0 \\ 2b \end{pmatrix}$

5. Jawaban : C

Pembahasan:




MR = 3

RN = $\sqrt{17}$

MN = $\sqrt{26}$

$\text{Sin}\angle MNR = \frac{MR}{MN}$

$= \frac{3}{\sqrt{26}}$

6. Jawaban : A

Pembahasan:

$[f(x)-g(x)]^2 = f(x)^2 + g(x)^2 - 2g(x)^2 - 2g(x)f(x) = 1$

$[f(x)+g(x)]^2 = f(x)^2 + g(x)^2 + 2(g)(x) \quad = 4$

$2\left[f(x)^2 + g(x)^2\right] = 5$

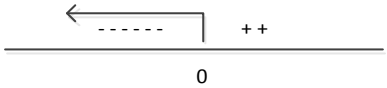
$f(x)^2 + g(x) = \frac{5}{2}$

7. Jawaban : C

Pembahasan:

$2 \cdot 3^x - 3^{-2x} - 1 < 0$

$2y^3 - y^2 - 1 < 0$




$3^x < 1$

$3^x < 3^0$

$X < 0$

8. Jawaban : D
Pembahasan:

$$\lim_{x\to 0} x\left(1-\sqrt{x+1}\right)\operatorname{cosec}^2 x$$

$$= \lim_{x\to 0} \frac{x\left(1-\sqrt{x+1}\right)}{\sin x \,.\, \sin x}$$

$$= \lim_{x\to 0} \frac{1-\sqrt{x+1}}{\sin x}$$

$$= \lim_{x\to 0} \frac{-\frac{1}{2}(x+1)^{-\frac{1}{2}}}{\cos x}$$

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



9. Jawaban : E
Pembahasan:

$a_2 + a_5 - a_4 = 10 \rightarrow ar + ar^4 - a_5^3 = 10$
$a_3 + a_6 - a_5 = 20 \rightarrow ar^2 + ar^5 - ar^4 = 20$

$(I : II) \rightarrow r + r - r = 2 \rightarrow \quad r = 2$
$a = 1$
$a_2 = 1 \,.\, 2 = 2$

10. Jawaban : A

Pembahasan:

$f(x)=a\sqrt{x}+\frac{b}{\sqrt{x}} \rightarrow 13=2a+\frac{b}{2} \rightarrow 4a+b=26 \ldots\ldots (I)$

$f(x)=a x^{\frac{1}{2}}+b.x^{-\frac{1}{2}}$

$f'(x)=\frac{1}{2}a x^{\frac{1}{2}}-\frac{1}{2}6x^{-\frac{3}{2}}$

$f''(x)=\frac{1}{4}a x^{-\frac{3}{2}}+\frac{3}{4}6x^{\frac{5}{2}}=0$

$f''(x)=-\frac{1}{4}a x^{-\frac{3}{2}}+\frac{3}{4}6x^{-\frac{5}{2}}=0$

$f''(4)=0 \rightarrow -\frac{a}{32}+\frac{3b}{4.32}=0$

- 4a + 3b = 0 ..... (II)

4a + b = 26 ..... (I)

4b = 26

$b = \frac{13}{2} = \frac{52}{8}$

$a = \frac{39}{8}$

$a + b = \frac{39}{8}+\frac{52}{8}=\frac{91}{8}$

11. Jawaban : B

Pembahasan:

$f(x)=f(x+2) \rightarrow f(x)=k$

$\int_0^2 k\,dx=13 \rightarrow 2k=13$

$\int_3^7 k\,dx=7k-3k=4k=2B$

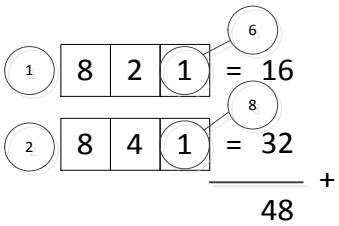
12. Jawaban : A

Pembahasan:

$L = \int_0^1 x^k - x\,dx=\frac{1}{4}$

$\frac{1}{k+1}=\frac{3}{4} \rightarrow k=\frac{1}{3}$

13. Jawaban : A
Pembahasan:




14. Jawaban : C
Pembahasan:
$y = 3 - x^2 \rightarrow (b = 3 - a^2)$. P (-a, b)
$y' = -2x \rightarrow m = 2a$

Persamaan garis singgung di P (-a, b)
$y - b = -2a (x + a)$
$y = 2ax + 2a^2 + b$
memotong di R = $(0, 2a^2 + b)$
Koordinat R $(0, b + a\sqrt{3})$

Jadi $2a^2 + b = b + a\sqrt{3}$
$2a^2 = a\sqrt{3}$
$a = \frac{1}{2}\sqrt{3}$

15. Jawaban: E
Pembahasan:
$a = 2 \rightarrow x2 - 3x + 2 = 0$
$(x - 1)(x - 2) = 0 \rightarrow x_1 = 1$
$x_2 = 2$

$b = 32 \rightarrow x2 - 12x + 32 = 0$
$(x - 4)(x - 8) = 0$
$y_1 = 4$
$y_2 = 8$

$x_1, x_2, y_1, y_2 \rightarrow 1, 2, 4, 8 \rightarrow$ deret geometri naik
Jadi $ab = 2 (-32) = -64$

# COMING SOON..

*aceh, medan, padang, bukit tinggi, bengkulu, lampung, depok, dki, ciamis, sukabumi, salatiga, solo,tulung agung, surabaya, jember,banyuwangi, makasar*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