PEMBAHASAN

SELEKSI NASIONAL MASUK PERGURUAN TINGGI NEGERI (SNMPTN)

Mata Pelajaran : Matematika IPA
Tanggal : 17 Juni 2010
Kode Soal : 546

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1. **Jawab : A**

$$\frac{1}{a}+\frac{1}{b}=\frac{13}{36}$$
$$\frac{a+b}{ab}=\frac{13}{36}$$

Salah satu kemungkinannya adalah
$a+b=13$ dan $ab=36$
Sehingga diperoleh
$ab(a+b)=36\cdot 13$
$=468$

2. **Jawab : A**

$|1-|1+3x|| = |1-(-1-3x)|$
$= |2+3x|$
$= -(2+3x)$
$= -2-3x$

3. **Jawab : B**

Akar $\sqrt{2}-\sqrt{5} \Rightarrow x=\sqrt{2}-\sqrt{5}$
Diperoleh
$x^2=2-2\sqrt{10}+5$
$=7-2\sqrt{10}$
$x^4=49-28\sqrt{10}+40$
$=89-28\sqrt{10}$
$=14(7-2\sqrt{10})-9$
$=14x^2-9$

Dengan demikian
$x^4-14x^2+9=0$

4. **Jawab : D**

$\vec{a}\perp\vec{b} \Rightarrow \vec{a}\cdot\vec{b}=0$
$\vec{a}\perp(\vec{b}+2\vec{c}) \Rightarrow \vec{a}\cdot(\vec{b}+2\vec{c})=0$
$\Rightarrow \vec{a}\cdot\vec{b}+2\vec{a}\cdot\vec{c}=0$
$\Rightarrow 0+2\vec{a}\cdot\vec{c}=0$
$\Rightarrow \vec{a}\cdot\vec{c}=0$
$\vec{a}\cdot(2\vec{b}-\vec{c})=2\vec{a}\cdot\vec{b}-\vec{a}\cdot\vec{c}$
$=2\cdot 0-0$
$=0$

5. **Jawab : C**

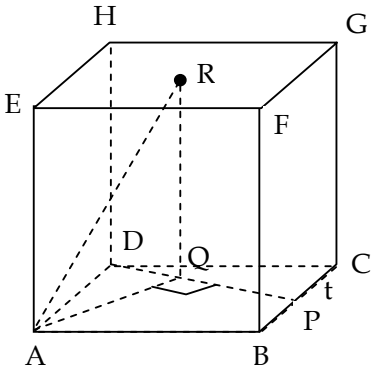
Jumlah 50 suku pertama deret
$\log 5+\log 55+\log 605+\log 6665+\ldots$
Cari $= S_{50}$
$= \frac{50}{2}(2a+49b)$
$= 25(2\log 5+49\log 11)$
$= 50\log 5+1225\log 11$
$= \log 5^{50}+\log 11^{1225}$
$= \log(5^{50}11^{1225})$
$= \log(25^{25}11^{1225})$

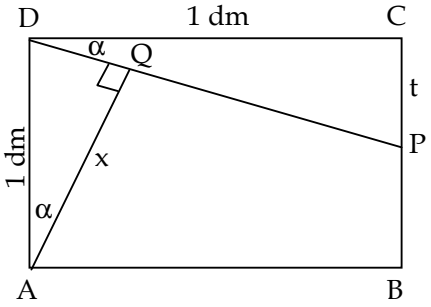
6. **Jawab : C**

$U_1=15$
$U_n-U_{n-1}=2n+3$
$U_n=U_{n-1}+2n+3$
$\rightarrow U_2=15+7=15+S_1 \rightarrow U_2=22$
$U_3=15+\underbrace{7+9}_{S_2}=15+S_2$
$U_4=\underbrace{15+7+9}_{S_3}+11=15+S_3$
.
.
.
$U_{50}=15+S_{49}$
$=15+\frac{49}{2}(14+48\cdot 2)$
$=15+2695$
$=2710$

Cari $U_2+U_{50}=2732$

7. **Jawab : A**





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

$$\frac{1}{\sqrt{t^2+1}} = \frac{x}{1}$$

$$x = \frac{1}{\sqrt{t^2+1}}$$

$$\text{Luas } \Delta AQR = \frac{1}{2} AQ \cdot QR$$

$$= \frac{1}{2}\frac{1}{\sqrt{t^2+1}} \cdot 1$$

$$= \frac{1}{2\sqrt{t^2+1}}$$

8. **Jawab : D**

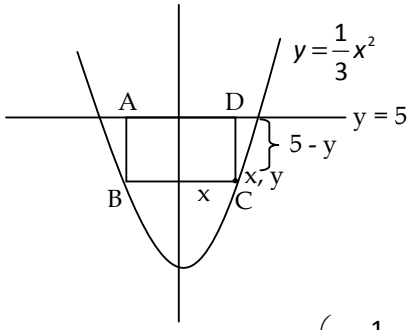
$\log x = \log y$

$x = y$

9. **Jawab : A**

$$\lim_{x\to 0} \frac{\sqrt{4x}}{\sqrt{\sin 2x}} = \lim_{x\to 0} \frac{\sqrt{4x}}{\sqrt{2x}} = \sqrt{2}$$

10. **Jawab : E**



$$L = L_{ABCD} = 2x\cdot(5-y) = 2x\left(5-\frac{1}{3}x^2\right)$$

$$= 10x - \frac{2}{3}x^3$$

Agar L_{maks}

$L' = 0$

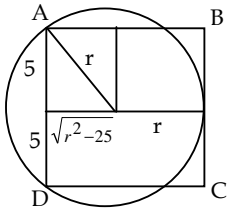
$10 - 2x^2 = 0$

$x^2 = 5$

$$L_{maks} = 2\sqrt{5}\cdot\left(5-\frac{5}{3}\right)$$

$$= \frac{20}{3}\sqrt{5}$$

11. **Jawab : C**



$$r + \sqrt{r^2-25} = 10$$

$$\sqrt{r^2-25} = 10 - r$$

$$r^2 - 25 = 100 - 20r + r^2$$

$$20r = 125$$

$$r = \frac{125}{20} = \frac{25}{4}$$

$$L = \pi r^2 = \frac{625}{16}\pi$$

12. **Jawab : C**

$F(x) = x + \sqrt{2p-3x}$

Agar F maksimum

$F' = 0$

$$1 + \frac{-3}{2\sqrt{2p-3x}} = 0$$

$$\sqrt{2p-3x} = \frac{3}{2}$$

$$2p - 3x = \frac{9}{4}$$

$$x = \frac{2}{3}p - \frac{3}{4}$$

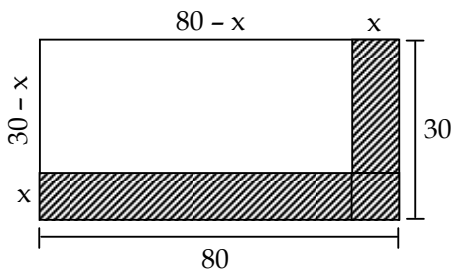
Diketahui $y_{maks} = \frac{5}{4}$

$$\frac{2}{3}p - \frac{3}{4} + \frac{3}{2} = \frac{5}{4}$$

$$\frac{2}{3}p = \frac{1}{2}$$

$$p = \frac{3}{4}$$

13. **Jawab : B**



Luas = 275

$(80-x)(30-x)=275$

$x^2-110x+2400=275$

$x^2-110x+2125=0$

$(x-25)(x-85)$

$x=25 \qquad \underbrace{x=85}$

TM

14. **Jawab : D**

2 putra 2 putri + 3 putra 1 putri + 4 putra

$=C_2^5\cdot C_2^5+C_3^5\cdot C_1^5+C_4^5$

$=10\cdot 10+10\cdot 5+5$

$=155$

$C_4^{10}=\frac{10!}{6!\cdot 4!}=\frac{10\cdot 9\cdot 8\cdot 7\cdot 6!}{6!\cdot 4\cdot 3\cdot 2\cdot 1}=210$

Peluang $=\frac{155}{210}=\frac{31}{42}$

15. **Jawab : D**

Titik potong : y = y

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

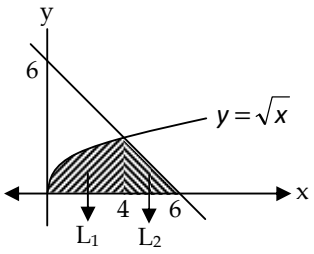
$x=x^2-12x+36$

$x^2-13x+36=0$

$(x-4)(x-9)=0$

$x=4$ atau $x=9$

$(4,2)$ atau $(9,-3)(TM)$



$L=L_1+L_2$

$=\int_0^4 \sqrt{x}dx+\int_4^6 (6-x)dx$

$=\int_0^4 \sqrt{x}dx-\int_4^6 (x-6)dx$