

$$\begin{aligned}
 1. \quad & 6(3^{40})^2 \log a + 3^{41}(2 \log a) = 3^{43} \\
 & 2 \cdot 3(3^{40})^2 \log a + 3^{41}(2 \log a) = 3^{41} \cdot 3^2 \\
 & 2 \log a + 2 \log a = 3^2 \\
 & 3 \cdot 2 \log a = 9 \\
 & 2 \log a = 3 \\
 & a = 8
 \end{aligned}$$

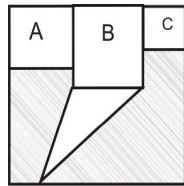
Jawaban: D

2. Misalkan x_1 dan x_2 adalah akar-akar persamaan kuadrat.

$$\begin{aligned}
 \text{Maka: } & a(x - x_1)(x - x_2) = 0 \\
 & a(x - 2)(x - 2) = 0 \text{ karena 2 adalah} \\
 & a(x - 2)^2 = 0 \text{ satu-satunya akar} \\
 & a(x - 2)^2 = \frac{1}{4}x^2 + bx + a \\
 & \frac{1}{4}(x - 2)^2 = \frac{1}{4}x^2 + bx + a \\
 & \frac{1}{4}(x^2 - 4x + 4) = \frac{1}{4}x^2 + bx + a \\
 & \frac{1}{4}x^2 - x + 1 = \frac{1}{4}x^2 + bx + a \\
 & \Leftrightarrow b = -1, a = 1 \\
 & a + b = 1 + (-1) = 0
 \end{aligned}$$

Jawaban : C

3. Luas A = 16, maka sisi A = 4
 Luas B = 36, maka sisi B = 6
 Luas C = 9, maka sisi C = 3
 Luas Segitiga = $\frac{6 \times (13 - 6)}{2} = 21$
 Luas Arsir = $13^2 - 36 - 16 - 9 - 21 = 87$



Jawaban : D

$$\begin{aligned}
 4. \quad & f(x - 2) = 3 - 2x \\
 & f(x - 2) = 3 - 2(x - 2 + 2) \\
 & f(x) = 3 - 2(x + 2) \\
 & f(x) = -2x - 1 \\
 & f(x + 2) = -3(x + 2) - 1 = -2x - 5 \\
 & g \circ f(x + 2) = 5 - 4x \\
 & g(-2x - 5) = 5 - 4x \\
 & \text{Supaya } g(-1), \text{ maka } -2x - 5 = -1 \\
 & -2x = 4 \\
 & x = -2
 \end{aligned}$$

Pilih $x = -2$

$$\begin{aligned}
 \text{Jadi, } & g(-1) = 5 - 4(-2) \\
 & = 5 - (-8) = 5 + 8 = 13
 \end{aligned}$$

Jawaban: B

5. Karena $f(1) = 0$ dan $f(x) \geq 0$, berarti parabola terbuka keatas dan menyinggung

sumbu $x(y = 0)$, sehingga puncak parabola itu $(1, 0)$.

Misalkan puncak (p, q) , maka
 Persamaan : $f(x) = a(x - p)^2 + q$

$$\text{Persamaan : } f(x) = a(x - 1)^2 + 0$$

$$f(2) = a(2 - 1)^2 = 0$$

$$f(2) = a = 2$$

$$\Rightarrow f(x) = 2(x - 1)^2$$

$$f(0) = 2(0 - 1)^2 = 2 \cdot (-1)^2 = 2 \cdot 1 = 2$$

$$f(4) = 2(4 - 1)^2 = 2 \cdot (3)^2 = 2 \cdot 9 = 18$$

$$\text{Jadi, } f(0) + f(4) = 2 + 18 = 20$$

Jawaban: B

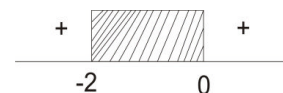
$$6. \quad \frac{x^2 - 3x + 1}{x^2 + 2x} \leq \frac{-2}{x + 2}$$

$$\frac{x^2 - 3x + 1 + 2x}{x^2 + 2x} \leq 0$$

$$\frac{x^2 - x + 1}{x(x + 2)} \leq 0$$

$$x^2 - x + 1 \Rightarrow \text{Definit positif}$$

$$x_1 = 0, x + 2 = 0 \Leftrightarrow x_2 = -2$$



Maka HP = $-2 < x < 0$

Jawaban : A

7. Misal: buku = x , pensil = y , penghapus = z

$$3x + y + 2z = 39.000 \dots (1)$$

$$x + 2y + 3z = 26.000 \dots (2)$$

$$x = y + 5.000 \dots (3)$$

Substitusi persamaan (3) ke pers. (1) dan (2),
 maka diperoleh $y = 7.000$

$$2y + z = 12.000$$

Maka $y = 5.000, z = 2.000$ dan $x = 10.000$

$$\begin{aligned}
 2x + 4 + 5z &= 2(10.000) + 4(5.000) + 5(2.000) \\
 &= 50.000
 \end{aligned}$$

Jawaban: E

$$8. \quad U_1 = a = 80 \text{ milyar}$$

$$U_5 = a + 4b = 130 \text{ milyar}$$

$$\text{diperoleh } 4b = 50, \text{ maka } 2b = 25$$

$$U_{11} = a + 10b = a + 5(2b)$$

$$= 80 + 5(25) = 80 + 125 = 205 \text{ milyar}$$

Jawaban : B

9. Misal : bilangan pertama = x
bilangan kedua = y

$$x - y = 36$$

$$x = 5y$$

$$\text{diperoleh } 3b = -36$$

$$b = -12$$

$$U_{10} = U_5 + 5b = 9 + 5(-12) = -51$$

Jawaban : E

10. Premis 1 = $p \vee q = \sim p \rightarrow q$

$$\text{Premis 2} = \sim q \vee r = q \rightarrow r$$

$$\text{Konklusi} = \sim p \rightarrow r = p \vee r$$

Jawaban : C

11. $AB = c = 4 \text{ cm}$

$$AC = b = \sqrt{5} \text{ cm}$$

$$BC = a = \sqrt{5} \text{ cm}$$

$$\cos B = \frac{a^2 + b^2 - c^2}{2 \cdot a \cdot b}$$

$$= \frac{(\sqrt{5})^2 + 4^2 - (\sqrt{5})^2}{2 \cdot 4(\sqrt{5})} = \frac{18}{8\sqrt{5}} = \frac{9}{4\sqrt{5}}$$

$$\sin(A+C) = \sin(180 - B)$$

$$= \sin B = \frac{1}{\sqrt{5}} = \frac{1}{5}\sqrt{5}$$

Jawaban : A

$$12. \begin{pmatrix} 2 & 4 \\ 0 & 1 \end{pmatrix} \cdot A = \begin{pmatrix} 2 & 3 \\ 0 & 1 \end{pmatrix}$$

$$A = \frac{1}{2} \begin{pmatrix} 2 & -4 \\ 0 & 2 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & -\frac{1}{2} \\ 0 & 1 \end{pmatrix}$$

$$A^{-1} = \begin{pmatrix} 1 & \frac{1}{2} \\ 0 & 1 \end{pmatrix}$$

$$\text{Jumlah semua elemen matriks } A^{-1} = \frac{5}{2}$$

Jawaban : B

$$13. f(x,y) = ax + by$$

$$f(1,4) = a + 4b$$

$$f(4,1) = 4a + b$$

$$a + 4b = 4a + b$$

$$a = b$$

$$\text{maka } \frac{a}{b} = 1$$

Jawaban : E

14. Misal : Harga awal = x

$$\text{Diskon I} = x - \frac{1}{5}x = \frac{4}{5}x$$

$$\text{Diskon II} = \frac{4}{5}x - \frac{1}{4} \cdot \frac{4}{5}x = \frac{3}{5}x$$

$$\text{Maka total diskon} = \left(x - \frac{3}{5}x\right) \cdot 100\% = 40\%$$

Jawaban : D

$$15. a_2 = a + b = 8$$

$$S_2 = 6a + 15b = 75$$

$$\text{dieliminasi diperoleh } b = 3 \text{ dan } a = 5$$

$$a_6 = a + 5b = 5 + 5(3) = 20$$

Jawaban : A

