

# Uji Capaian Pembelajaran 1

## A. Pilihan Ganda

$$\begin{array}{r}
 1. \quad \begin{array}{r} 2x+3 \\ 2x^2-x-1 \overline{) 4x^3+4x^2-x-5} \\ \underline{4x^3-2x^2-2x-} \\ 6x^2+x-5 \\ \underline{6x^2-3x-3-} \\ 4x-2 \end{array}
 \end{array}$$

∴ Hasil bagi dan sisa pada pembagian suku banyak  $4x^3+4x^2-x-5$  oleh  $2x^2-x-1$  adalah  $2x+3$  dan  $4x-2$ .

Jawaban: C

$$\begin{array}{r}
 2. \quad \begin{array}{r} x^3+3x^2-5x+10 \\ x^2-2x-3 \overline{) x^5+x^4-14x^3+11x^2-13x-10} \\ \underline{x^5-2x^4-3x^3} \\ 3x^4+11x^3+11x^2-13x-10 \\ \underline{3x^4-6x^3-9x^2} \\ -5x^3+20x^2-13x-10 \\ \underline{-5x^3+10x^2+15x-} \\ 10x^2-20x-10 \\ \underline{10x^2-20x-30-} \\ -8x+20 \end{array}
 \end{array}$$

$$\therefore H(x) = x^3 + 3x^2 - 5x + 10$$

$$S(x) = -8x + 20$$

Jawaban: A.

$$3. \quad \circ 3x+1 \Rightarrow k_1 = -\frac{1}{3}$$

$$k_1 = -\frac{1}{3} \left| \begin{array}{ccc} 3 & -5 & a & -1 \\ & -1 & 2 & -\frac{1}{3}(a+2) \\ 3 & -6 & a+2 & -\frac{1}{3}a - \frac{5}{3} \end{array} \right| +$$

$$\Rightarrow -\frac{1}{3}a - \frac{5}{3} = 0 \Leftrightarrow a = -5$$

$$\Rightarrow H(x) = 3x^2 - 6x + (-5) + 2 = 3x^2 - 6x - 3$$

Jawaban: D.

$$4. \quad f(x) = ax^3 - 7x + b.$$

◦ Sisa bagi  $f(x)$  dan  $(x+1)$  adalah  $-2$

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

$$\Leftrightarrow a(-1)^3 - 7(-1) + b = -2.$$

$$\Leftrightarrow -a + 7 + b = -2$$

$$\Leftrightarrow a - b = 9$$

◦ Sisa bagi  $f(x)$  dan  $x-2$  adalah  $4$ .

$$\Rightarrow f(2) = 4$$

$$\Leftrightarrow a(2)^3 - 7(2) + b = 4$$

$$\Leftrightarrow 8a + b = 18$$

$$\dots \Rightarrow \underline{a - b = 9 +}$$

$$9a = 27 \Leftrightarrow a = 3.$$

$$\Rightarrow a - b = 9 \Rightarrow 3 - b = 9$$

$$\Leftrightarrow b = -6$$

$$\therefore a + b = 3 + (-6) = -3.$$

Jawaban: D

5. Misalkan sisa bagi  $f(x)$  oleh  $(2x^2 - 7x - 15)$  adalah  $ax + b$

$$\circ 2x^2 - 7x - 15 = (x-5)(2x+3)$$

◦ Sisa bagi  $f(x)$  oleh  $(x-5) = 19$

$$\Rightarrow f\left(-\frac{(-5)}{1}\right) = f(5) = a(5) + b = 19.$$

$$\Leftrightarrow 5a + b = 19 \dots \text{Pers (1)}$$

◦ Sisa bagi  $f(x)$  oleh  $(2x+3) = -12$

$$\Rightarrow f\left(-\frac{3}{2}\right) = a\left(-\frac{3}{2}\right) + b = -12$$

$$\Leftrightarrow -\frac{3}{2}a + b = -12$$

$$\circ \text{Pers (1)} \Rightarrow \underline{5a + b = 19 -}$$

$$-\frac{13}{2}a = -26$$

$$\Leftrightarrow a = 4$$

$$\circ \text{Pers (1)} \Rightarrow 5(4) + b = 19.$$

$$\Leftrightarrow b = -6$$

∴ Sisa bagi  $f(x)$  oleh  $(2x^2 - 7x - 15)$  adalah  $(4x - 6)$

Jawaban: C

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# Uji Capaian Pembelajaran 1

6.  $x^2 - 1 = (x-1)(x+1)$

•  $f(x)$  habis dibagi  $(x^2-1)$

$\Rightarrow$  Sisa bagi  $f(x)$  oleh  $(x+1) = 0$  [1]

• Sisa bagi  $f(x)$  oleh  $(x-1) = 5$  [2]

• Misalkan sisa bagi  $f(x)$  oleh  $(x^2-3x-4)$  adalah  $ax+b$

$\Rightarrow f(x) = H(x) \cdot (x^2-3x-4) + (ax+b)$

$\Leftrightarrow f(x) = H(x) \cdot (x+1)(x-4) + (ax+b)$

[1]  $\Rightarrow f\left(-\frac{1}{1}\right) = f(-1) = 0$

$\Leftrightarrow H(-1) \cdot (-1+1)(-1-4) + (a(-1)+b) = 0$

$\Leftrightarrow H(-1) \cdot 0 \cdot (-5) - a + b = 0$

$\Leftrightarrow a = b$  [3]

[2]  $\Rightarrow f\left(\frac{-4}{1}\right) = f(4) = 5$

$\Leftrightarrow H(4) \cdot (4+1)(4-4) + (a(4)+b) = 5$

$\Leftrightarrow H(4) \cdot 5 \cdot 0 + 4a + b = 5$

[3]  $\Rightarrow 4b + b = 5 \Leftrightarrow 5b = 5 \Leftrightarrow b = 1$

$\Rightarrow a = b = 1 \Leftrightarrow a = 1$

$\therefore$  Sisa bagi  $f(x)$  oleh  $(x^2-3x-4)$  adalah  $x+1$

Jawaban: D.

7.  $f(x) = x^3 + 2x^2 + px + q$

•  $h(x) = x^2 + x - 2 = (x+2)(x-1)$  adalah faktor dari  $f(x)$

$\Rightarrow h(x) \cdot g(x) = f(x)$ ;  $g(x)$  suatu fungsi

$\Leftrightarrow (x+2)(x-1) \cdot g(x) = x^3 + 2x^2 + px + q$

•  $x = -2$

$\Rightarrow (-2+2)(-2-1) \cdot g(-2) = (-2)^3 + 2(-2)^2 + p(-2) + q$

$\Rightarrow -2p + q - 8 + 8 = 0$

$\Leftrightarrow -2p + q = 0$  ..... Pers (1).

•  $x = 1$

$\Rightarrow (1+2)(1-1) \cdot g(1) = 1^3 + 2 \cdot 1^2 + p \cdot 1 + q$

$\Leftrightarrow p + q + 3 = 0 \Leftrightarrow p + q = -3$

• Pers (1)  $\longrightarrow -2p + q = 0$

$3p = -3 \Leftrightarrow p = -1$

•  $p + q = -3$  dan  $p = -1 \Rightarrow q = -2$

$\therefore p - q = -1 - (-2) = -1 + 2 = 1$

Jawaban: C

8.  $(x - (-3))(x - 4) = x^2 - x - 12$

$$\begin{array}{r} x^2 - x - 12 \\ x^2 - x - 12 \overline{) x^4 - 2x^3 - 13x^2 + 14x + 24} \\ \underline{x^4 - x^3 - 12x^2} \phantom{+ 24} \\ -x^3 - x^2 + 14x + 24 \\ \underline{-x^3 + x^2 + 12x} \phantom{+ 24} \\ -2x^2 + 2x + 24 \\ \underline{-2x^2 + 2x + 12} \\ 12 \end{array}$$

$\Rightarrow x^4 - 2x^3 - 13x^2 + 14x + 24 = 0$

$\Leftrightarrow (x^2 - x - 12)(x^2 - x - 2) = 0$

$\Leftrightarrow (x^2 - x - 12)(x-2)(x+1) = 0$

$\therefore$  Dua akar yang lain adalah -1 atau 2.

Jawaban: C.

9. Akar-akar persamaan

$9x^3 + 9x^2 - 46x + 24 = 0$  adalah

$x_1, x_2, x_3$

$\Rightarrow x_1 + x_2 + x_3 = -\frac{b}{a} = -\frac{9}{9} = -1$

Jawaban: B.

10.  $30 = 5 \cdot 2 \cdot 3 = (-5) \cdot (-2) \cdot 3$

•  $-9 = (-5) + (-2) + 3$

•  $-11 = (-5) \cdot (-2) + (-2) \cdot 3 + (-5) \cdot 3$

$\Rightarrow x^3 - 4x^2 - 11x + 30 = 0$

$\Leftrightarrow (x-5)(x-2)(x+3) = 0$

$\Rightarrow x_3 = 5; x_2 = 2; x_1 = -3$

$\Rightarrow \frac{2x_1 + x_2}{x_3} = \frac{2(-3) + 2}{5} = -\frac{4}{5}$

Jawaban: R.

# Uji Capaian Pembelajaran II

11.  $f(x) = x^3 - ax^2 + bx - 2$  mempunyai faktor  $(x-2)$

$$\Rightarrow f(2) = 0 \Leftrightarrow 2^3 - a \cdot 2^2 + b \cdot 2 - 2 = 0$$

$$\Leftrightarrow 4a - 2b = 8 - 2 = 6$$

$$\Leftrightarrow 2a - b = 3$$

• sisa bagi  $f(x)$  oleh  $(x+1) = -3$

$$\Leftrightarrow f(-1) = -3 \Leftrightarrow (-1)^3 - a \cdot (-1)^2 + b \cdot (-1) - 2 = -3$$

$$\Leftrightarrow -1 - a - b - 2 = -3$$

$$\Leftrightarrow -a - b = 0$$

$$\Leftrightarrow \underline{a + b = 0} \Leftrightarrow a = -b$$

$$\bullet 2a - b = 3 \Rightarrow -2b - b = 3 \Leftrightarrow -3b = 3$$

$$\Rightarrow b = -1$$

$$\Rightarrow a = -(-1) = 1$$

$$\therefore a + b = 1 + (-1) = 0$$

Jawaban: A.

12. Faktor  $-2 = 1, -1, 2, -2$

$$\bullet f(x) = 3x^3 + 2x^2 - 3x - 2$$

$$\Rightarrow f(1) = 3 + 2 - 3 - 2 = 0$$

$$\Rightarrow (x-1) \text{ faktor } f(x)$$

$$\Rightarrow 3x^3 + 2x^2 - 3x - 2 = 0$$

$$\Leftrightarrow (x-1)(3x^2 + 5x + 2) = 0$$

$$\left( \begin{array}{l} \bullet 3 \cdot 2 = 6 \text{ dan } 3 + 2 = 5 \\ \downarrow \end{array} \right.$$

$$\Rightarrow (x-1)\left(x + \frac{2}{3}\right)\left(x + \frac{2}{3}\right) = 0$$

$$\Rightarrow x_1 = -1, x_2 = -\frac{2}{3}, x_3 = 1$$

$$\Rightarrow \frac{x_3 - x_1}{x_2} = \frac{1 - (-1)}{-\frac{2}{3}} = -3$$

Jawaban: E

13.  $\begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix}$  dan  $\begin{pmatrix} 3 \\ 7 \\ 6 \end{pmatrix}$  tidak bisa dijumlahkan

karena jumlah baris berbeda

•  $\begin{pmatrix} -1 & 3 & 7 \\ 7 & 5 & 4 \end{pmatrix}$  dan  $(5 \ 6 \ -8)$  tidak bisa

dijumlahkan karena jumlah baris berbeda (3)

$$\bullet \begin{pmatrix} 2 & 9 & 13 \\ -5 & 8 & 23 \\ 4 & 9 & 12 \end{pmatrix} \text{ dan } \begin{pmatrix} 2 & 2 & 12 \\ 6 & 9 & 27 \\ 3 & -8 & 9 \end{pmatrix} \text{ bisa}$$

dijumlahkan karena banyak baris dan banyak kolom kedua matriks sama.

•  $(3 \ -7 \ 9)$  dan  $(5 \ 2)$  tidak bisa

dijumlahkan karena banyak kolom tidak sama.

$$\bullet \begin{pmatrix} 2 & 2 \\ 3 & 4 \end{pmatrix} \text{ dan } \begin{pmatrix} -9 & 8 & 7 \\ 3 & 5 & 6 \\ -1 & 3 & 7 \end{pmatrix} \text{ tidak bisa dijumlahkan}$$

karena banyak baris dan banyak kolom tidak sama.

Jawaban: C.

$$14. \bullet A + 3B = \begin{pmatrix} 4 & 5 \\ 2 & -8 \\ 4 & 3 \end{pmatrix} + \begin{pmatrix} -24 & 6 \\ -21 & 0 \\ 29 & 9 \end{pmatrix} = \begin{pmatrix} -20 & 11 \\ -19 & -8 \\ 20 & 12 \end{pmatrix}$$

$$\bullet (A + 3B)C = \begin{pmatrix} -20 & 11 \\ -19 & -8 \\ 20 & 12 \end{pmatrix} \begin{pmatrix} 4 & 3 & 1 & -1 \\ 3 & 2 & 4 & -3 \end{pmatrix}$$

$$= \begin{pmatrix} -97 & -38 & 29 & -13 \\ -100 & -73 & -51 & 43 \\ 190 & 100 & 76 & -64 \end{pmatrix}$$

Jawaban: B.

$$15. \begin{pmatrix} 4 & -2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} p & q \\ r & s \end{pmatrix} = \begin{pmatrix} 2 & 22 \\ 11 & 12 \end{pmatrix}$$

$$\Rightarrow 4p - 2r = 2 \Leftrightarrow 2p - r = 1$$

$$\bullet p + 3r = 11 \Leftrightarrow \underline{2p + 6r = 22}$$

$$-7r = -21$$

$$\Leftrightarrow r = 3$$

$$\Rightarrow 2p - 3 = 1$$

$$\Leftrightarrow p = 2$$

$$\bullet 4q - 2s = -22 \Leftrightarrow 2q - s = -11$$

$$\bullet q + 3s = 12 \Leftrightarrow \underline{2q + 6s = 24}$$

$$-7s = -35$$

$$\Leftrightarrow s = 5$$

$$\bullet 2q - s = -11 \Leftrightarrow 2q - 5 = -11 \Leftrightarrow q = -3$$

$$\Rightarrow (p-s)^2 + (q-r)^2 = (-3-5)^2 + (-6-3)^2 = 45$$

Jawaban: C.

# Uji Capaian Pembelajaran 1.

16.  $PQ = P^T$ ; misalkan  $P = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{pmatrix} 3 & 2 \\ 3 & -2 \end{pmatrix} = \begin{pmatrix} 18 & 6 \\ 4 & -12 \end{pmatrix}^T$$

$$\begin{pmatrix} 3a+3b & 2a-2b \\ 3c+3d & 2c-2d \end{pmatrix} = \begin{pmatrix} 18 & 4 \\ 6 & -12 \end{pmatrix}$$

$$\Rightarrow 3a+3b = 18 \Leftrightarrow a+b = 6$$

$$2a-2b = 4 \Leftrightarrow a-b = 2 +$$

$$2a = 8 \Leftrightarrow a = 4$$

$$\Rightarrow 4 - b = 2 \Leftrightarrow b = 2$$

$$\Rightarrow 3c+3d = 6 \Leftrightarrow c+d = 2$$

$$2c-2d = -12 \Leftrightarrow c-d = -6 +$$

$$2c = -4 \Leftrightarrow c = -2$$

$$\Rightarrow -2 - d = -6 \Leftrightarrow d = 4.$$

$$\therefore P = \begin{pmatrix} 4 & 2 \\ -2 & 4 \end{pmatrix}$$

Jawaban: A.

17.  $P = \begin{pmatrix} x-5 & -x \\ x+7 & 2 \end{pmatrix}$

- P matriks singular

$$\Rightarrow (x-5) \cdot 2 - (-x)(x+7) = 0$$

$$\Leftrightarrow x^2 + 7x + 2x - 10 = 0$$

$$\Leftrightarrow x^2 + 9x - 10 = 0$$

$$\Leftrightarrow (x+10)(x-1) = 0.$$

$$\therefore x = -10 \text{ dan } x = 1$$

Jawaban: C.

18.  $|A| = \begin{vmatrix} 2 & 2 & 4 \\ 1 & 3 & 2 \\ 3 & 2 & 2 \end{vmatrix}$

$$= (12 + 12 + 0) - (36 + 0 + 4) = -16$$

$$|B| = \begin{vmatrix} 5 & 2 & 2 \\ 4 & 3 & 1 \\ 0 & 2 & 3 \end{vmatrix}$$

$$= (95 + 0 + 16) - (0 + 10 + 24) = 27$$

$$\therefore |A| - |B| = -16 - 27 = -43$$

Jawaban: A.

19.  $PQ = \begin{pmatrix} 4 & 0 & -1 \\ -1 & 2 & 0 \\ 2 & -1 & 0 \end{pmatrix} \begin{pmatrix} 1 & 1 & 1 \\ 2 & 0 & 1 \\ -1 & 0 & 1 \end{pmatrix} = \begin{pmatrix} 5 & 4 & 3 \\ 3 & -1 & 1 \\ 0 & 2 & 1 \end{pmatrix}$

$$|PQ| = \begin{vmatrix} 5 & 4 & 3 \\ 3 & -1 & 1 \\ 0 & 2 & 1 \end{vmatrix} = (-5 + 0 + 18) - (0 + 10 + 12) = -9.$$

$$\Rightarrow (PQ)^{-1} = \frac{1}{-9} \begin{pmatrix} -1-2 & -(4-6) & 4-(-3) \\ -(3-0) & 5-0 & -(5-9) \\ 6-0 & -(10-0) & -5-12 \end{pmatrix}$$

$$= -\frac{1}{9} \begin{pmatrix} -3 & 2 & 7 \\ -3 & 5 & 4 \\ 6 & -10 & -17 \end{pmatrix}$$

$$\Rightarrow [(PQ)^{-1}]^T = -\frac{1}{9} \begin{pmatrix} -3 & -3 & 6 \\ 2 & 5 & -10 \\ 7 & 4 & -17 \end{pmatrix}$$

Jawaban: D

20.  $2x + 2y + z = 12$   
 $x + y + 2z = 3 \Rightarrow \begin{pmatrix} 2 & 2 & 1 \\ 1 & 1 & 2 \\ 1 & 4 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 12 \\ 3 \\ 20 \end{pmatrix}$   
 $x + 4y + z = 20$

$$\bullet D = \begin{vmatrix} 2 & 2 & 1 \\ 1 & 1 & 2 \\ 1 & 4 & 1 \end{vmatrix} = 2 + 4 + 4 - (1 + 16 + 2) = -9$$

$$\bullet D_x = \begin{vmatrix} 12 & 2 & 1 \\ 3 & 1 & 2 \\ 20 & 4 & 1 \end{vmatrix} = 12 + 80 + 12 - (20 + 96 + 6) = -10.$$

$$\bullet D_y = \begin{vmatrix} 2 & 12 & 1 \\ 1 & 3 & 2 \\ 1 & 20 & 1 \end{vmatrix} = 6 + 24 + 20 - (3 + 80 + 12) = -45$$

$$\bullet D_z = \begin{vmatrix} 2 & 2 & 12 \\ 1 & 1 & 3 \\ 1 & 4 & 20 \end{vmatrix} = 40 + 6 + 40 - (12 + 24 + 40) = 18$$

$$\therefore x = \frac{D_x}{D} = \frac{-10}{-9} = 2$$

$$y = \frac{D_y}{D} = \frac{-45}{-9} = 5.$$

$$z = \frac{D_z}{D} = \frac{18}{-9} = -2.$$

$$\therefore H_p = \{2, 5, -2\}.$$

4 Jawaban: D.

## Uji Capaian Pembelajaran 1

21.  $T = \begin{pmatrix} 3 \\ -5 \end{pmatrix}$   
 $P(-6, -7) \xrightarrow{T} P'$   
 $\Rightarrow P'(-6+3, -7+(-5)) = P'(-3, -12).$

Jawaban: B

22.  $T = \begin{pmatrix} -2 \\ -4 \end{pmatrix}$   
 $(x, y) \xrightarrow{T} (x', y')$   
 $\Rightarrow x' = x + (-2) \Leftrightarrow x = x' + 2$   
 $\circ y' = y + (-4) \Leftrightarrow y = y' + 4$   
 $\Rightarrow$  Bayangan garis  $5x - 4y - 20 = 0$  oleh translasi  $T = \begin{pmatrix} -2 \\ -4 \end{pmatrix}$   
 $\equiv 5(x+2) - 4(y+4) - 20 = 0$   
 $\equiv 5x - 4y - 26 = 0$

23.  $M_{y=-x}$   
 $(x, y) \xrightarrow{M_{y=-x}} (x', y')$   
 $\circ x' = -y \Leftrightarrow y = -x'$   
 $\circ y' = -x \Leftrightarrow x = -y'$   
 $\therefore$  Bayangan garis  $y = 3x - 2$  oleh pencerminan terhadap garis  $y = -x$   
 $\equiv -x - 3(-y) = 2$   
 $\equiv x - 3y = -2$

Jawaban: C.

24.  $M_{y=x}$   
 $P(a, b) \xrightarrow{M_{y=x}} P'(-4, 5)$   
 $\Rightarrow -4 = b \Leftrightarrow b = -4$   
 $\circ 5 = a \Leftrightarrow a = 5$   
 $\Rightarrow (a-b)^2 = (5-(-4))^2 = 81$

Jawaban: B.

25.  $R_{90^\circ}$   
 $M(-3, 9) \xrightarrow{R_{90^\circ}} M'(x', y')$   
 $\Rightarrow \begin{pmatrix} x' \\ y' \end{pmatrix} = \begin{pmatrix} \cos 90^\circ & -\sin 90^\circ \\ \sin 90^\circ & \cos 90^\circ \end{pmatrix} \begin{pmatrix} -3 \\ 9 \end{pmatrix}$   
 $= \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} -3 \\ 9 \end{pmatrix} = \begin{pmatrix} -9 \\ -3 \end{pmatrix}$   
 $\therefore M' = (-9, -3)$   
 Jawaban: E.

26.  $R[(-2, 4); 270^\circ]$   
 $(x, y) \xrightarrow{R[(-2, 4); 270^\circ]} (x', y')$   
 $\Rightarrow \begin{pmatrix} x' \\ y' \end{pmatrix} = \begin{pmatrix} \cos 270^\circ & -\sin 270^\circ \\ \sin 270^\circ & \cos 270^\circ \end{pmatrix} \begin{pmatrix} x+2 \\ y-4 \end{pmatrix} + \begin{pmatrix} -2 \\ 4 \end{pmatrix}$   
 $= \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \begin{pmatrix} x+2 \\ y-4 \end{pmatrix} + \begin{pmatrix} -2 \\ 4 \end{pmatrix}$

$\Rightarrow x' = y - 4 + (-2) \Leftrightarrow y = x' + 6$   
 $\circ y' = -(x+2) + 4 \Leftrightarrow x = -y' + 2$   
 $\therefore$  Bayangan parabola  $y = x^2 + 3x + 6$  oleh  $R[(-2, 4); 270^\circ]$

$\equiv (x+6) = (-y'+2)^2 + 3(-y'+2) + 6$   
 $\Leftrightarrow x+6 = y'^2 - 4y' + 4 - 3y' + 6 + 6$   
 $\Leftrightarrow y'^2 = x + 7y' - 10$

Jawaban: E

27.  $D[(0, 0); 4]$   
 $(x, y) \xrightarrow{D[(0, 0); 4]} (x', y')$   
 $\Rightarrow x' = 4x \Leftrightarrow x = \frac{1}{4}x'$   
 $\circ y' = 4y \Leftrightarrow y = \frac{1}{4}y'$   
 $\Rightarrow$  Bayangan parabola  $x = y^2 - 5$  oleh  $D[(0, 0); 4]$   
 $\equiv \frac{1}{4}x = \left(\frac{1}{4}y'\right)^2 - 5$   
 $\equiv \frac{1}{4}x = \frac{1}{16}y'^2 - 5$   
 $\equiv 4x = y'^2 - 80$   
 $\equiv y'^2 - 4x - 80 = 0$

Jawaban: C.

28.  $D[(3, 2); k]$   
 $(x, y) \xrightarrow{D[(3, 2); k]} (x', y')$

$\Rightarrow x' = k(x-3) + 3$   
 $\circ y' = k(y-2) + 2$

karena  $l_1 \equiv y = x^2 + 9x - 8$  dan  $l_2 \equiv y = 2x^2 + 3x - 12$ , dimana

$l_1 \xrightarrow{D[(3, 2); k]} l_2$

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$$\Rightarrow l_1 \equiv k(y-2)+2 = 2(k(x-3)+3)^2 + 3(k(x-3)+3) - 12$$

$$\Rightarrow l_1 \equiv ky - 2k + 2 = 2(k^2(x-3)^2 + 6k(x-3) + 9) + 3k(x-3) + 9$$

$$\Rightarrow l_1 \equiv ky - 2k + 2 = 2k^2(x^2 - 6x + 9) + 15k(x-3) + 15$$

$$\Rightarrow l_1 \equiv ky - 2k + 2 = 2k^2x^2 - 12k^2x + 18k^2 + 15kx - 45k + 15$$

$$\Rightarrow l_1 \equiv ky = 2k^2x^2 - (12k^2 - 15k)x + 18k^2 - 43k + 13$$

$$\Rightarrow y = x^2 + 9x + (-8) \Rightarrow ky = 2k^2x^2 + (-12k^2 + 15k)x + (18k^2 - 43k + 13)$$

$$\Rightarrow \frac{k}{2k^2} = \frac{1}{1} \Rightarrow k = 2k^2 \Rightarrow k = \frac{1}{2}$$

\* Cara lebih mudah fokus ke koefisien y dan x<sup>2</sup>

Jawaban: C.

$$29. T_1 = \begin{pmatrix} 2 \\ 5 \end{pmatrix}; T_2 = \begin{pmatrix} 5 \\ 1 \end{pmatrix} \Rightarrow T_2 \circ T_1 = \begin{pmatrix} 2+5 \\ 5+1 \end{pmatrix} = \begin{pmatrix} 7 \\ 6 \end{pmatrix}$$

$$\Rightarrow (x, y) \xrightarrow{(T_2 \circ T_1)} (x', y')$$

$$\Rightarrow x' = x + 7 \Rightarrow x = x' - 7$$

$$y' = y + 6 \Rightarrow y = y' - 6$$

\therefore Bayangan garis  $5x - 2y + 24 = 0$  oleh transformasi  $T_2 \circ T_1$

$$\equiv 5(x-7) - 2(y-6) + 24 = 0$$

$$\equiv 5x - 2y + 1 = 0 \quad \text{Jawaban: D}$$

$$30. Q(a, b) \xrightarrow{D[(-1, 2); 2]} Q'(a', b')$$

$$Q'(a', b') \xrightarrow{R[(-2, 5); -90^\circ]} Q''(-13, -10)$$

$$\Rightarrow a' = 2(a+1) - 1 = 2a + 1$$

$$b' = 2(b-2) + 2 = 2b - 2$$

$$\Rightarrow \begin{pmatrix} -13 \\ -10 \end{pmatrix} = \begin{pmatrix} \cos(-90^\circ) & -\sin(-90^\circ) \\ \sin(-90^\circ) & \cos(-90^\circ) \end{pmatrix} \begin{pmatrix} a'+2 \\ b'-5 \end{pmatrix} + \begin{pmatrix} -2 \\ 5 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} -13 \\ -10 \end{pmatrix} = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \begin{pmatrix} 2a+1+2 \\ 2b-2-5 \end{pmatrix} + \begin{pmatrix} -2 \\ 5 \end{pmatrix}$$

$$\Rightarrow -13 = (2b-2-5) + (-2)$$

$$\Rightarrow -13 = 2b - 9 \Rightarrow b = -2$$

$$\Rightarrow -10 = -(2a+1+2) + 5$$

$$\Rightarrow 2a + 3 = 15 \Rightarrow a = 6$$

$$\therefore (a+b) = 6 + (-2) = 4$$

Jawaban: D.

# Jji Capaian Pembelajaran 1

## B. Uraian

1. Hasil bagi :  $H(x)$

Sisa bagi :  $S(x)$

$$\begin{array}{r}
 a). \quad \frac{\frac{1}{2}x^2 + \frac{15}{8}x + \frac{131}{32}}{4x-5} \sqrt{2x^3 + 5x^2 + 7x + 0} \\
 \underline{2x^3 - \frac{5}{2}x^2} \quad - \\
 \frac{15}{2}x^2 + 7x + 0 \\
 \underline{\frac{15}{2}x^2 - \frac{75}{8}x} \quad - \\
 \frac{131}{8}x + 0 \\
 \underline{\frac{113}{8}x - \frac{655}{32}} \quad - \\
 8 + \frac{655}{32} \\
 = \frac{256}{32} + \frac{655}{32} = \frac{911}{32}
 \end{array}$$

$$\therefore H(x) = \frac{1}{2}x^2 + \frac{15}{8}x + \frac{131}{32}$$

$$S(x) = \frac{911}{32}$$

$$\begin{array}{r}
 b). \quad \frac{x+3}{2x^2-x-1} \sqrt{2x^3 + 5x^2 + 0} \\
 \underline{2x^3 - x^2 - x} \quad - \\
 6x^2 + x + 0 \\
 \underline{6x^2 - 3x - 3} \quad - \\
 4x + 11
 \end{array}$$

$$\therefore H(x) = x+3 \quad ; \quad S(x) = 4x+11$$

c).  $(x^4 - 3x^3 - 4x^2 + 5x + 12)$  dibagi  $(x-4)$

$$\bullet x=4 \Rightarrow k_1 = -\frac{-4}{1} = 4$$

$$\begin{array}{r|rrrrr}
 k_1 = 4 & 1 & -3 & -4 & 5 & 12 \\
 & & 4 & 4 & 0 & 20 & + \\
 \hline
 & 1 & 1 & 0 & 5 & 32
 \end{array}$$

$$\therefore H(x) = x^3 + x^2 + 5$$

$$S(x) = 32$$

d).  $(x^4 - 2x^3 - 13x^2 + 14x + 24)$  dibagi

$(x^2 - 4) \sim$  Proses Horner Bertingkat

$$\bullet (x^2 - 4) \Rightarrow k_1 = -\frac{b}{a} = -\frac{0}{1} = 0$$

$$k_2 = -\frac{c}{a} = -\frac{-4}{1} = 4$$

$$\begin{array}{r|rrrrrr}
 k_1 = 0 & 1 & -2 & -13 & 14 & 24 \\
 & * & 0 & 0 & 0 & * \\
 k_2 = 4 & * & * & * & * & * \\
 \hline
 & 1 & -2 & -9 & 6 & -12 & +
 \end{array}$$

$$\therefore H(x) = x^2 - 2x - 9$$

$$S(x) = 6x - 12$$

e).  $(x^4 - 2x^3 - 8x^2 - 14x + 6)$  dibagi

$$(x^2 - 5x + 6)$$

\* Proses Horner Bertingkat

• Rembagi  $x^2 - 5x + 6$

$$\Rightarrow k_1 = -\frac{-5}{1} = 5 \quad ; \quad k_2 = -\frac{6}{1} = -6$$

$$\begin{array}{r|rrrrrr}
 k_1 = 5 & 1 & -2 & -8 & -14 & 6 \\
 & + & 5 & 15 & 5 & * \\
 k_2 = -6 & * & * & * & * & * \\
 \hline
 & 1 & 3 & 1 & -27 & 0
 \end{array}$$

$$\therefore H(x) = x^2 + 3x + 1$$

$$S(x) = -27x$$

f).  $(2x^4 + 4x^3 - 12x^2 - 14x + 24)$  dibagi  $(2x+1)$

$$\begin{array}{r}
 \frac{x^3 + \frac{3}{2}x^2 - \frac{27}{4}x - \frac{29}{8}}{2x+1} \sqrt{2x^4 + 4x^3 - 12x^2 - 14x + 24} \\
 \underline{2x^4 + x^3} \quad - \\
 3x^3 - 12x^2 - 14x + 24 \\
 \underline{3x^3 + \frac{3}{2}x^2} \quad - \\
 -\frac{27}{2}x^2 - 14x + 24 \\
 \underline{-\frac{27}{2}x^2 - \frac{27}{4}x} \quad - \\
 -\frac{29}{4}x + 24 \\
 \underline{-\frac{29}{4}x - \frac{29}{8}} \quad - \\
 \frac{221}{8}
 \end{array}$$

# Uji Capaian Pembelajaran 1.

$$\therefore H(x) = x^3 + \frac{3}{2}x^2 - \frac{27}{4}x - \frac{29}{8}$$

$$S(x) = \frac{221}{8}$$

g).  $(3x^4 + 8x^3 + x^2 + x + 7)$  dibagi  $(3x+2)$ .

◦ Pembagi =  $(3x+2)$

$$\Rightarrow k_1 = -\frac{2}{3}$$

$$k_1 = -\frac{2}{3} \begin{array}{r|rrrrr} 3 & 3 & 8 & 1 & 1 & 7 \\ & & -2 & -4 & 2 & -2 \\ \hline & 3 & 6 & -3 & 3 & 5 \end{array}$$

$$\therefore H(x) = 3x^3 + 6x^2 - 3x + 3$$

$$S(x) = 5$$

h).  $(6x^4 - 12x^3 - 4x^2 + 15x + 30)$  dibagi

oleh  $(6x^2 + 5x - 6)$

◦ Proses : Horner - Kino

$$\Rightarrow k_1 = -\frac{c}{a} = -\frac{-6}{6} = 1$$

$$k_2 = -\frac{b}{a} = -\frac{5}{6}$$

$$k_1 = 1 \begin{array}{r|rrrrr} 6 & 6 & -12 & -4 & 15 & 30 \\ & + & & + & 6 & -17 & \frac{97}{6} \\ & & & & 85 & \frac{185}{6} & * \\ & & & & 5 & \frac{85}{6} & \frac{36}{6} \\ \hline & 6 & -17 & \frac{97}{6} & -\frac{557}{36} & x \end{array}$$

$$\Rightarrow x = 30 + \frac{97}{6} = \frac{180 + 97}{6} = \frac{277}{6}$$

$$\therefore H(x) = \left(6x^2 - 17x + \frac{97}{6}\right) \cdot \frac{1}{6}$$

$$= x^2 - \frac{17}{6}x + \frac{97}{36}$$

$$S(x) = -\frac{557}{36}x + \frac{277}{6}$$

i).  $(2x^5 + x^4 - 3x^3 - 5x^2 + x + 8)$  dibagi oleh  $(x^2 - 4x - 5)$ .

◦ Proses Horner - Kino

$$\Rightarrow k_1 = -\frac{c}{a} = -\frac{-5}{1} = 5; k_2 = -\frac{b}{a} = -\frac{-4}{1} = 4$$

$$k_1 = 5 \begin{array}{r|rrrrrr} 2 & 2 & 1 & -3 & -5 & 7 & 8 \\ & * & * & 10 & 45 & 215 & 1060 \\ & & & 8 & 36 & 172 & 848 \\ & & & & 212 & 1070 & 1068 \\ \hline & 2 & 9 & 43 & 212 & 1070 & 1068 \end{array}$$

$$\therefore H(x) = 2x^3 + 9x^2 + 43x + 212$$

$$S(x) = 1.070x + 1.068$$

j).  $2x^5 + 7x^4 - 2x^3 - 9x^2 + 19x + 11$

dibagi  $x+6$

$$\Rightarrow k_1 = -\frac{6}{1} = -6$$

$$k = -6 \begin{array}{r|rrrrrr} 2 & 2 & 7 & -2 & -9 & 19 & 11 \\ & & -12 & 30 & -168 & 1062 & -6456 \\ \hline & 2 & -5 & 28 & -177 & 1076 & -6445 \end{array}$$

$$\therefore H(x) = 2x^4 - 5x^3 + 28x^2 - 177x + 1076$$

$$S(x) = -6.445$$

## 2. Akar-akar rasional

a).  $x^3 + x - 2 = 0$ ;

$$\text{mis. } f(x) = x^3 + x - 2$$

◦ karena faktor  $-2 = 1, -1, 2, -2$ .

$$\square f(1) = 1^3 + 1 - 2 = 0$$

$$\Rightarrow (x^3 + x - 2) = 0$$

$$\Leftrightarrow x^3 - x^2 + x^2 - x + 2x - 2 = 0$$

$$\Leftrightarrow x^2(x-1) + x(x-1) + 2(x-1) = 0$$

$$\Leftrightarrow (x-1)(x^2 + x + 2) = 0$$

◦ karena Determinan  $[x^2 + x + 2 = 0]$

$$= 1^2 - 4 \cdot 1 \cdot 2 = -7 < 0$$

$\therefore$  Akar-akar dari  $x^3 + x - 2 = 0$

hanya  $\{1\}$

b).  $3x^3 - 6x^2 - 9x = 0$

$$[3x(x^2 - 2x - 3) = 0] \div 3$$

$$x(x^2 - 2x - 3) = 0$$

$$x(x-3)(x+1) = 0$$

$\therefore$  Akar-akar dari  $3x^3 - 6x^2 - 9x = 0$

$$= \{-1, 0, 3\}$$



## Uji Capaian Pembelajaran 4

c).  $\circ f(x) = x^3 - 3x^2 - 33x + 35$

$\circ$  Faktor 35 =  $\{1, -1, 5, -5, 7, -7, 35, -35\}$ .

$\circ f(1) = 1 - 3 - 33 + 35 = 0$

$\Rightarrow x^3 - 3x^2 - 33x + 35 = 0$

$\Leftrightarrow x^3 - x^2 - 2x^2 + 2x - 35x + 35 = 0$

$\Leftrightarrow x^2(x-1) - 2x(x-1) - 35(x-1) = 0$

$\Leftrightarrow (x^2 - 2x - 35)(x-1) = 0$

$\circ (-7) \cdot 5 = -35$  dan  $-7 + 5 = -2$

$\Rightarrow x^3 - 3x^2 - 33x + 35 = 0$

$\Leftrightarrow (x-7)(x+5)(x-1) = 0$

$\therefore$  Akar-akar dari  $x^3 - 3x^2 - 33x + 35 = 0$  adalah  $-5, -1$ , dan  $-7$ .

d).  $\circ f(x) = 2x^3 - x^2 - 15x + 18$

$\circ$  Faktor 18 =  $\{1, -1, 2, -2, 3, -3, 6, -6, 9, -9, 18, -18\}$ .

$\circ f(1) = 2 - 1 - 15 + 18 = 4 \neq 0$

$\circ f(-1) = 2(-1)^3 - (-1)^2 - 15(-1) + 18$   
 $= -2 - 1 + 15 + 18$

$= 30 \neq 0$

$\circ f(2) = 2(2)^3 - (2)^2 - 15(2) + 18$   
 $= 16 - 4 - 30 + 18 = 0$

$\Rightarrow 2x^3 - x^2 - 15x + 18 = 0$

$\Leftrightarrow 2x^3 - 4x^2 + 3x^2 - 6x - 9x + 18 = 0$

$\Leftrightarrow 2x^2(x-2) + 3x(x-2) - 9(x-2) = 0$

$\Leftrightarrow (2x^2 + 3x - 9)(x-2) = 0$

$\circ 2 \cdot (-9) = -18 = 6 \cdot (-3)$ , dan  
 $3 = 6 + (-3)$

$\Rightarrow 2x^3 - x^2 - 15x + 18 = 0$

$\Leftrightarrow \left(x + \frac{6}{2}\right)\left(x - \frac{3}{2}\right)(x-2) = 0$

$\therefore$  Akar-akar dari  $2x^3 - x^2 - 15x + 18 = 0$  adalah  $-3, \frac{3}{2}$ , dan  $2$ .

e).  $\circ f(x) = 6x^3 + 11x^2 - x - 6$

$\circ$  Faktor  $-6 = \{1, -1, 2, -2, 3, -3, 6, -6\}$ .

$\circ f(1) = 6 + 11 - 1 - 6 = 10 \neq 0$

$\circ f(-1) = -6 + 11 - (-1) - 6 = 0$

$\Rightarrow 6x^3 + 11x^2 - x - 6 = 0$

$\Leftrightarrow 6x^3 + 6x^2 + 5x^2 + 5x - 6x - 6 = 0$

$\Leftrightarrow 6x^2(x+1) + 5x(x+1) - 6(x+1) = 0$

$\Leftrightarrow (6x^2 + 5x - 6)(x+1) = 0$

$\circ 6 \cdot (-6) = -36 = 9 \cdot (-4)$ , dan  
 $5 = 9 + (-4)$

$\Rightarrow 6x^3 + 11x^2 - x - 6 = 0$

$\Leftrightarrow \left(x + \frac{9}{6}\right)\left(x - \frac{4}{6}\right)(x+1) = 0$

$\therefore$  Akar-akar  $6x^3 + 11x^2 - x - 6 = 0$

adalah  $-\frac{9}{6}, -1$ , dan  $\frac{4}{6}$ ; atau

$-\frac{3}{2}, -1$ , dan  $\frac{2}{3}$

f).  $\circ f(x) = x^4 + 4x^3 + 4x^2 - 3x - 6 = 0$

$\circ$  Faktor  $-6 = \{1, -1, 2, -2, 3, -3, 6, -6\}$

$\circ f(1) = 1 + 4 + 4 - 3 - 6 = 0$

$\Rightarrow x^4 + 4x^3 + 4x^2 - 3x - 6 = 0$

$\Leftrightarrow x^4 - x^3 + 5x^3 - 5x^2 + 9x^2 - 9x + 6x - 6 = 0$

$\Leftrightarrow x^3(x-1) + 5x^2(x-1) + 9x(x-1) + 6(x-1) = 0$

$\Leftrightarrow (x^3 + 5x^2 + 9x + 6)(x-1) = 0$

$\circ g(x) = x^3 + 5x^2 + 9x + 6$

$\circ$  Faktor 6 =  $\{1, -1, 2, -2, 3, -3, 6, -6\}$

$\circ g(1) = 1 + 5 + 9 + 6 \neq 0$

$\circ g(-1) = -1 + 5 + 9(-1) + 6 = 1 \neq 0$

$\circ g(2) = 2^3 + 5(2)^2 + 9(2) + 6 \neq 0$

# Uji Capaian Pembelajaran 1

$$\begin{aligned} \circ g(-2) &= (-2)^3 + 5(-2)^2 + 9(-2) + 6 \\ &= -8 + 20 - 18 + 6 \\ &= 0 \end{aligned}$$

$$\Rightarrow x^4 + 4x^3 + 4x^2 - 3x - 6 = 0$$

$$\Leftrightarrow (x^3 + 5x^2 + 9x + 6)(x-1) = 0$$

$$\Leftrightarrow (x^3 + 2x^2 + 3x^2 + 6x + 3x + 6)(x-1) = 0$$

$$\Leftrightarrow (x^2(x+2) + 3x(x+2) + 3(x+2))(x-1) = 0$$

$$\Leftrightarrow (x^2 + 3x + 3)(x+2)(x-1) = 0$$

$$\circ \text{Determinan}(x^2 + 3x + 3 = 0)$$

$$= 3^2 - 4 \cdot 1 \cdot 3 = -3 < 0$$

$\therefore$  Akar-akar dari  $x^4 + 4x^3 + 4x^2 - 3x - 6 = 0$  adalah -2 dan 1.

$$g) \circ f(x) = x^4 - 2x^3 - 13x^2 + 19x + 24$$

$$\circ \text{Faktor } 24 = \{1, -1, 2, -2, 3, -3, 4, -4, 6, -6, 8, -8, 12, -12, 24, -24\}$$

$$\circ f(1) = 1 - 2 - 13 + 19 + 24 \neq 0$$

$$\circ f(-1) = 1 - 2(-1) - 13 + 19(-1) + 24$$

$$= 1 + 2 - 13 - 19 + 24$$

$$= 0$$

$$\Rightarrow x^4 - 2x^3 - 13x^2 + 19x + 24 = 0$$

$$\Leftrightarrow x^4 + x^3 - 3x^3 - 3x^2 - 10x^2 - 10x + 29x + 24 = 0$$

$$\Leftrightarrow x^3(x+1) - 3x^2(x+1) - 10x(x+1) + 24(x+1)$$

$$= 0$$

$$\Leftrightarrow (x^3 - 3x^2 - 10x + 24)(x+1) = 0$$

$$\circ g(x) = x^3 - 3x^2 - 10x + 24$$

$$\circ \text{Faktor } 24 = \{1, -1, 2, -2, 3, -3, 4, -4, 6, -6, 8, -8, 12, -12, 24, -24\}$$

$$\circ g(1) = 1 - 3 - 10 + 24 \neq 0$$

$$\circ g(-1) = (-1)^3 - 3(-1)^2 - 10(-1) + 24 = 30 \neq 0$$

$$\circ g(2) = 2^3 - 3 \cdot 2^2 - 10 \cdot 2 + 24$$

$$= 8 - 12 - 20 + 24 = 0$$

$$\Rightarrow x^4 - 2x^3 - 13x^2 + 19x + 24 = 0$$

$$\Leftrightarrow (x^3 - 3x^2 - 10x + 24)(x+1) = 0$$

$$\Leftrightarrow (x^3 - 2x^2 - x^2 + 2x - 12x + 24)(x+1) = 0$$

$$\Leftrightarrow (x^2(x-2) - x(x-2) - 12(x-2))(x+1) = 0$$

$$\Leftrightarrow (x^2 - x - 12)(x-2)(x+1) = 0$$

$$\circ -12 = (-4) \cdot 3 \text{ dan } -1 = (-4) + 3$$

$$\Rightarrow x^4 - 2x^3 - 13x^2 + 19x + 24 = 0$$

$$\Leftrightarrow (x^2 - x - 12)(x-2)(x+1) = 0$$

$$\Leftrightarrow (x-4)(x+3)(x-2)(x+1) = 0$$

$\therefore$  Akar-akar  $x^4 - 2x^3 - 13x^2 + 19x + 24 = 0$  adalah -3, -1, 2, dan 4.

$$h) \circ f(x) = 6x^4 - 13x^3 + 13x - 6$$

$$\circ \text{Faktor } -6 = \{1, -1, 2, -2, 3, -3, 6, -6\}$$

$$\circ f(1) = 6 - 13 + 13 - 6 = 0$$

$$\Rightarrow 6x^4 - 13x^3 + 13x - 6 = 0$$

$$\Leftrightarrow 6x^4 - 6x^3 - 7x^3 + 7x^2 - 7x^2 + 7x + 6x - 6 = 0$$

$$\Leftrightarrow 6x^3(x-1) - 7x^2(x-1) - 7x(x-1) + 6(x-1)$$

$$= 0$$

$$\Leftrightarrow (6x^3 - 7x^2 - 7x + 6)(x-1) = 0$$

$$\circ g(x) = 6x^3 - 7x^2 - 7x + 6$$

$$\circ g(1) = 6 - 7 - 7 + 6 = -2 \neq 0$$

$$\circ g(-1) = 6(-1)^3 - 7(-1)^2 - 7(-1) + 6$$

$$= -6 - 7 + 7 + 6 = 0$$

$$\Rightarrow 6x^4 - 13x^3 + 13x - 6 = 0$$

$$\Leftrightarrow (6x^3 - 7x^2 - 7x + 6)(x-1) = 0$$

$$\Leftrightarrow (6x^3 + 6x^2 - 13x^2 - 13x + 6x + 6)(x-1) = 0$$

$$\Leftrightarrow (6x^2(x+1) - 13x(x+1) + 6(x+1))(x-1) = 0$$

$$\Leftrightarrow (6x^2 - 13x + 6)(x+1)(x-1) = 0$$

$$\circ 6 \cdot 6 = 36 = (-9) \cdot (-4), \text{ dan}$$

$$-13 = (-9) + (-4)$$

## Uji Capaian Pembelajaran 1

$$\Rightarrow 6x^4 - 13x^3 + 13x - 6 = 0$$

$$\Leftrightarrow (6x^2 - 13x + 6)(x+1)(x-1) = 0$$

$$\Leftrightarrow \left(x - \frac{9}{6}\right) \left(x - \frac{4}{6}\right) (x+1)(x-1) = 0$$

$$\Rightarrow x = \frac{9}{6} = \frac{3}{2} ; x = \frac{4}{6} = \frac{2}{3} ; x = -1 ; x = 1$$

$\therefore$  Akar-akar  $6x^4 - 13x^3 + 13x - 6 = 0$  adalah  $-1, \frac{2}{3}, 1, \text{ dan } \frac{3}{2}$

$$i). f(x) = 24x^4 - 98x^3 - 129x^2 + 98x - 15$$

• Faktor  $-15 = \{1, -1, 3, -3, 5, -5, 15, -15\}$ .

$$\bullet f(1) = 24 - 98 - 129 + 98 - 15 \neq 0$$

$$\bullet f(-1) = 24 \cdot (-1)^4 - 98 \cdot (-1)^3 - 129 \cdot (-1)^2 + 98 \cdot (-1) - 15$$

$$= 24 + 98 - 129 - 98 - 15 \neq 0$$

$$\bullet f(3) = 24 \cdot (3)^4 - 98(3)^3 - 129(3)^2 + 98 \cdot 3 - 15$$

$$= 1.944 - 2.646 - 1.161 + 294 - 15$$

$$\neq 0$$

$$\bullet f(-3) = 24 \cdot (-3)^4 - 98(-3)^3 - 129(-3)^2 + 98(-3) - 15$$

$$= 1.944 + 2.646 - 1.161 - 294 - 15$$

$$\neq 0$$

$$\bullet f(5) = 24 \cdot 5^4 - 98 \cdot 5^3 - 129 \cdot 5^2 + 98 \cdot 5 - 15$$

$$= 15.000 - 12.250 - 3.225 + 490 - 15$$

$$= 2.750 - 3.240 + 490$$

$$= 2.750 - 3.250 + 500$$

$$= 0$$

$$\Rightarrow 24x^4 - 98x^3 - 129x^2 + 98x - 15 = 0$$

$$\Leftrightarrow 24x^4 - 120x^3 + 22x^3 - 110x^2 - 19x^2 + 95x + 3x - 15 = 0$$

$$\Leftrightarrow 24x^3(x-5) + 22x^2(x-5) - 19x(x-5) + 3(x-5) = 0$$

$$\Leftrightarrow (24x^3 + 22x^2 - 19x + 3)(x-5) = 0$$

$$\bullet g(x) = 24x^3 + 22x^2 - 19x + 3$$

$$\Rightarrow f(x) = g(x)(x-5)$$

Karena  $1, -1, 3, \text{ dan } -3$  bukan faktor dari  $f(x) = 0$

$\Rightarrow 1, -1, 3, \text{ dan } -3$  bukan faktor dari

$$g(x) = 0$$

• Faktor  $24 = \{1, -1, 2, -2, 3, -3, 4, -4, 6, -6, 8, -8, 12, -12, 24, -24\}$

$$\bullet g\left(\frac{1}{2}\right) = 24 \cdot \left(\frac{1}{2}\right)^3 + 22 \cdot \left(\frac{1}{2}\right)^2 - 19 \cdot \frac{1}{2} + 3$$

$$= 3 + \frac{11}{2} - \frac{19}{2} + 3 = 2 \neq 0$$

$$\bullet g\left(-\frac{1}{2}\right) = 24 \cdot \left(-\frac{1}{2}\right)^3 + 22 \cdot \left(-\frac{1}{2}\right)^2 - 19 \cdot \left(-\frac{1}{2}\right) + 3$$

$$= -3 + \frac{11}{2} + \frac{19}{2} + 3 = 15 \neq 0$$

$$\bullet g\left(\frac{1}{3}\right) = 24 \cdot \left(\frac{1}{3}\right)^3 + 22 \cdot \left(\frac{1}{3}\right)^2 - 19 \cdot \frac{1}{3} + 3$$

$$= \frac{8}{9} + \frac{22}{9} - \frac{19}{3} + 3 = \frac{30}{9} - \frac{19}{3} + 3$$

$$= \frac{10}{3} - \frac{19}{3} + 3 = -\frac{9}{3} + 3 = 0$$

$$\Rightarrow 24x^4 - 98x^3 - 129x^2 + 98x - 15 = 0$$

$$\Leftrightarrow (24x^3 + 22x^2 - 19x + 3)(x-5) = 0$$

$$\Leftrightarrow (24x^3 - 8x^2 + 30x^2 - 10x - 9x + 3)(x-5) = 0$$

$$\Leftrightarrow (8x^2(3x-1) + 10x(3x-1) - 3(3x-1))(x-5) = 0$$

$$\Leftrightarrow (8x^2 + 10x - 3)(3x-1)(x-5) = 0$$

$$\bullet 8 \cdot (-3) = -24 = 12 \cdot (-2), \text{ dan}$$

$$10 = 12 + (-2)$$

$$\Rightarrow 24x^4 - 98x^3 - 129x^2 + 98x - 15 = 0$$

$$\Leftrightarrow (8x^2 + 10x - 3)(3x-1)(x-5) = 0$$

$$\Leftrightarrow \left(x + \frac{12}{8}\right) \left(x - \frac{2}{8}\right) (3x-1)(x-5) = 0$$

$$\Rightarrow x = -\frac{12}{8} = -\frac{3}{2} ; x = \frac{2}{8} = \frac{1}{4} ; 3x-1 \Leftrightarrow x = \frac{1}{3} ;$$

dan  $x=5$

$\therefore$  Akar-akar  $24x^4 - 98x^3 - 129x^2 + 98x - 15 = 0$  adalah  $-\frac{3}{2}, -\frac{1}{4}, \frac{1}{3}, \text{ dan } 5$ .

# Uji Capaian Pembelajaran 1

$$j). \circ f(x) = x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120$$

◦ Faktor -120

$$= \sqrt[1]{1, -1, 2, -2, 3, -3, 4, -4, 5, -5, 6, -6, 8, -8, 10, -10, 12, -12, 15, -15, 20, -20, 24, -24, 30, -30, 40, -40, 60, -60, 120, -120}$$

$$\begin{aligned} \circ f(1) &= 1 - 15 + 05 - 225 + 279 - 120 \\ &= -15 + 05 + 1 + 279 - 225 - 120 \\ &= 70 + 50 - 120 \\ &= 0 \end{aligned}$$

$$\Rightarrow x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

$$\Leftrightarrow x^5 - x^4 - 14x^4 + 14x^3 + 71x^3 - 71x^2 - 159x^2 + 159x + 120x - 120 = 0$$

$$\Leftrightarrow x^4(x-1) - 14x^3(x-1) + 71x^2(x-1) - 159x(x-1) + 120(x-1) = 0$$

$$\Leftrightarrow (x^4 - 14x^3 + 71x^2 - 159x + 120)(x-1) = 0$$

$$\circ g(x) = x^4 - 14x^3 + 71x^2 - 159x + 120$$

$$\begin{aligned} \circ g(1) &= 1 - 14 + 71 - 159 + 120 \\ &= 50 - 39 \neq 0 \end{aligned}$$

$$\begin{aligned} \circ g(-1) &= (-1)^4 - 14(-1)^3 + 71(1)^2 - 159(-1) + 120 \\ &= 1 + 14 - 71 + 159 + 120 \neq 0 \end{aligned}$$

$$\begin{aligned} \circ g(2) &= (2)^4 - 14(2)^3 + 71(2)^2 - 159(2) + 120 \\ &= 16 - 112 + 284 - 308 + 120 \\ &= 16 + 284 - (112 + 308) + 120 \\ &= 300 - 420 + 120 = 0 \end{aligned}$$

$$\Rightarrow x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

$$\Leftrightarrow (x^4 - 14x^3 + 71x^2 - 159x + 120)(x-1) = 0$$

$$\Leftrightarrow (x^4 - 2x^3 - 12x^3 + 29x^2 + 47x^2 - 99x - 60x + 120)(x-1) = 0$$

$$\Leftrightarrow (x^3(x-2) - 12x^2(x-2) + 47x(x-2) - 60(x-2))(x-1) = 0$$

$$\Rightarrow x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

$$\Leftrightarrow (x^3 - 12x^2 + 47x - 60)(x-2)(x-1) = 0$$

$$\circ h(x) = x^3 - 12x^2 + 47x - 60$$

$$\begin{aligned} \circ \text{Faktor } -60 &= \sqrt[1]{-1, 1, 2, -2, 3, -3, 4, -4, 5, -5, 6, -6, 10, -10, 12, -12, 15, -15, 20, -20, 30, -30, 60, -60} \end{aligned}$$

$$\circ g(x) = h(x)(x-2)$$

◦ 1 dan -1 bukan faktor  $g(x)$

$$\begin{aligned} \circ h(2) &= 2^3 - 12(2)^2 + 47(2) - 60 \\ &= 8 - 48 + 94 - 60 \neq 0 \end{aligned}$$

$$\begin{aligned} \circ h(-2) &= (-2)^3 - 12(-2)^2 + 47(-2) - 60 \\ &= -8 - 48 - 96 - 60 \neq 0 \end{aligned}$$

$$\begin{aligned} \circ h(3) &= 3^3 - 12(3)^2 + 47(3) - 60 \\ &= 27 - 108 + 141 - 60 \\ &= 0 \end{aligned}$$

$$\Rightarrow x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

$$\Leftrightarrow (x^3 - 12x^2 + 47x - 60)(x-2)(x-1) = 0$$

$$\Leftrightarrow (x^3 - 3x^2 - 9x^2 + 27x + 20x - 60)(x-2)(x-1) = 0$$

$$\Leftrightarrow (x^2(x-3) - 9x(x-3) + 20(x-3))(x-2)(x-1) = 0$$

$$\Leftrightarrow (x^2 - 9x + 20)(x-3)(x-2)(x-1) = 0$$

$$\circ 20 = (-4) \cdot (-5) \text{ dan } -9 = (-4) + (-5)$$

$$\Rightarrow x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

$$\Leftrightarrow (x^2 - 9x + 20)(x-3)(x-2)(x-1) = 0$$

$$\Leftrightarrow (x-5)(x-4)(x-3)(x-2)(x-1) = 0$$

$\therefore$  Akar-akar persamaan

$$x^5 - 15x^4 + 05x^3 - 225x^2 + 279x - 120 = 0$$

adalah 1, 2, 3, 4, dan 5.

# Uji Capaian Pembelajaran 1

3. a).  $A = \begin{pmatrix} 4 & 6 \\ 3 & -1 \end{pmatrix}$

$$\Rightarrow |A| = 4 \cdot (-1) - 6 \cdot 3 = -4 - 18 = -22$$

$$\Rightarrow A^{-1} = \frac{1}{|A|} \begin{pmatrix} -1 & -6 \\ -3 & 4 \end{pmatrix} = -\frac{1}{22} \begin{pmatrix} -1 & -6 \\ -3 & 4 \end{pmatrix}$$

$$= \begin{pmatrix} \frac{1}{22} & \frac{3}{11} \\ \frac{3}{22} & -\frac{2}{11} \end{pmatrix}$$

b).  $B = \begin{pmatrix} 2 & 4 & -4 \\ 0 & -2 & 2 \\ 1 & -1 & 4 \end{pmatrix}$

$$\Rightarrow |B| = [2 \cdot (-2) \cdot 4 + 4 \cdot 2 \cdot 1 + (-4) \cdot 0 \cdot (-1)]$$

$$- [1 \cdot (-2) \cdot (-4) + (-1) \cdot 2 \cdot 2 + 4 \cdot 0 \cdot 4]$$

$$= (-16 + 8 + 0) - (8 - 4 + 0)$$

$$= -8 - 4$$

$$= -12$$

$$\Rightarrow B^{-1} = \frac{1}{|B|} \begin{pmatrix} -8 - (-2) & -(16 - 4) & 8 - 8 \\ - (0 - 2) & 8 - (-4) & -4 - 0 \\ 0 - (-2) & -(-2 - 4) & -4 - 0 \end{pmatrix}$$

$$= -\frac{1}{12} \begin{pmatrix} -6 & -12 & 0 \\ 2 & 12 & -4 \\ 2 & 6 & -4 \end{pmatrix}$$

$$= \begin{pmatrix} \frac{1}{2} & 1 & 0 \\ -\frac{1}{6} & -1 & \frac{1}{3} \\ -\frac{1}{6} & -\frac{1}{2} & \frac{1}{3} \end{pmatrix}$$

4. a).  $T = \begin{pmatrix} 1 \\ -5 \end{pmatrix}$   
 $P(10, -12) \xrightarrow{T} P'(10+1, -12+(-5))$

$$\therefore P'(11, -17)$$

b).  $T = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$   
 $(x, y) \xrightarrow{T} (x', y')$

$$\Rightarrow x' = x + 4 \Leftrightarrow x = x' - 4$$

$$\Rightarrow y' = y + 6 \Leftrightarrow y = y' - 6$$

$$\therefore \text{Bayangan garis } -5x + 4y = 18$$

$$\equiv -5(x-4) + 4(y-6) = 18$$

$$\equiv -5x + 4y = 22$$

c).  $(x, y) \xrightarrow{R_{60^\circ}} (x', y')$

$$\begin{pmatrix} x' \\ y' \end{pmatrix} = \begin{pmatrix} \cos 60^\circ & -\sin 60^\circ \\ \sin 60^\circ & \cos 60^\circ \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} x' \\ y' \end{pmatrix} = \begin{pmatrix} \frac{1}{2} & -\frac{1}{2}\sqrt{3} \\ \frac{1}{2}\sqrt{3} & \frac{1}{2} \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$$

$$\Rightarrow \begin{cases} x' = \frac{1}{2}x - \frac{1}{2}\sqrt{3}y \\ y' = \frac{1}{2}\sqrt{3}x + \frac{1}{2}y \end{cases}$$

$$\Leftrightarrow 2\sqrt{3}x' = \sqrt{3}x - 3y \dots (1)$$

$$\Rightarrow y' = \frac{1}{2}\sqrt{3}x + \frac{1}{2}y$$

$$\Leftrightarrow 2y' = \sqrt{3}x + y \dots (2)$$

$$(1) \rightarrow 2\sqrt{3}x' = \sqrt{3}x - 3y$$

$$2y' - 2\sqrt{3}x' = 4y$$

$$y = \frac{1}{4}(-2\sqrt{3}x' + 2y')$$

$$y = -\frac{1}{2}\sqrt{3}x' + \frac{1}{2}y'$$

$$(2) \rightarrow 2y' = \sqrt{3}x + y$$

$$\Rightarrow 2y' = \sqrt{3}x + (-\frac{1}{2}\sqrt{3}x' + \frac{1}{2}y')$$

$$\Leftrightarrow \sqrt{3}x = \frac{1}{2}\sqrt{3}x' + \frac{3}{2}y'$$

$$\Leftrightarrow x = \frac{1}{2}x' + \frac{1}{2}\sqrt{3}y'$$

$$\therefore \text{Bayangan parabola } 2x^2 + 5x + 4y + 16 = 0$$

$$\equiv 2\left(\frac{1}{2}x' + \frac{1}{2}\sqrt{3}y'\right)^2 + 5\left(\frac{1}{2}x' + \frac{1}{2}\sqrt{3}y'\right)$$

$$+ 4\left(-\frac{1}{2}\sqrt{3}x' + \frac{1}{2}y'\right) + 16 = 0$$

$$\equiv 2\left(\frac{1}{4}x'^2 + \frac{3}{4}y'^2 + \frac{1}{2}\sqrt{3}x'y'\right)$$

$$+ \frac{5}{2}x' + \frac{5}{2}\sqrt{3}y' - \frac{4}{2}\sqrt{3}x' + \frac{4}{2}y' + 16 = 0$$

$$\equiv \frac{1}{2}x'^2 + \frac{3}{2}y'^2 + \sqrt{3}x'y' + \frac{5}{2}x' + \frac{5}{2}\sqrt{3}y'$$

$$- 2\sqrt{3}x' + 2y' + 16 = 0$$

$$\equiv x'^2 + 2\sqrt{3}x'y' + 3y'^2 + (5 - 2\sqrt{3})x'$$

$$+ (5\sqrt{3} + 2)y' + 16 = 0$$

# Uji Capaian Pembelajaran 1.

5. misalkan garis  $l$  & garis  $2x + 7y = 19$

$$\Rightarrow m_l = -\frac{1}{-\frac{2}{7}} = \frac{7}{2}$$

o garis  $l$  melalui titik  $(4, -1)$

$$\Rightarrow l \equiv y - (-1) = \frac{7}{2}(x - 4)$$

$$\equiv 2(y + 1) = 7(x - 4)$$

$$\equiv 2y + 2 = 7x - 28$$

$$\equiv 7x - 2y = 30$$

$$o (x, y) \xrightarrow{T = \begin{pmatrix} 2 \\ -6 \end{pmatrix}} (x', y')$$

$$\Rightarrow x' = x + 2 \text{ dan } y' = y - 6$$

$$o (x', y') \xrightarrow{M(x=4)} (x'', y'')$$

$$\Rightarrow x'' = 2 \cdot 4 - x' = 8 - (x + 2) = -x + 6$$

$$\Rightarrow x'' = -x + 6$$

$$o y'' = y' = y - 6 \Rightarrow y'' = y - 6$$

$$o (x'', y'') \xrightarrow{R - 270^\circ} (x''', y''')$$

$$\Rightarrow \begin{pmatrix} x''' \\ y''' \end{pmatrix} = \begin{pmatrix} \cos(-270^\circ) & -\sin(-270^\circ) \\ \sin(-270^\circ) & \cos(-270^\circ) \end{pmatrix} \begin{pmatrix} x'' \\ y'' \end{pmatrix}$$

$$= \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} x'' \\ y'' \end{pmatrix}$$

$$\Rightarrow x''' = -y'' = -(y - 6) = -y + 6$$

$$\Rightarrow x''' = -y + 6$$

$$o y''' = x'' = -x + 6 \Rightarrow y''' = -x + 6$$

$$o (x''', y''') \xrightarrow{D[(-2, 3); 3]} (x^{iv}, y^{iv})$$

$$\Rightarrow x^{iv} = 3(x''' + 2) - 2$$

$$\Rightarrow x^{iv} = 3(-y + 6 + 2) - 2$$

$$\Rightarrow x^{iv} + 2 = 3(-y + 8)$$

$$\Rightarrow y = -\frac{1}{3}(x^{iv} + 2) + 8$$

$$o y^{iv} = 3(y''' - 3) + 3$$

$$\Rightarrow y^{iv} = 3((-x + 6) - 3) + 3$$

$$\Rightarrow y^{iv} - 3 = 3(-x + 3)$$

$$\Rightarrow x = -\frac{1}{3}(y^{iv} - 3) + 3$$

$\therefore$  Bayangan persamaan garis

$$7x - 2y = 30$$

$$\equiv 7\left(-\frac{1}{3}(y - 3) + 3\right) - 2\left(-\frac{1}{3}(x + 2) + 0\right) = 30$$

$$\equiv -\frac{7}{3}(y - 3) + 21 + \frac{2}{3}(x + 2) - 0 = 30$$

$$\equiv -\frac{7}{3}(y - 3) + \frac{2}{3}(x + 2) = 25$$

$$\equiv -7(y - 3) + 2(x + 2) = 75$$

$$\equiv 2x - 7y = 50$$

1. Berdasarkan grafik dan tabel pada stimulus, didapatkan persamaan

$$\begin{cases} 5x + 2y + 6z = 117.000 \\ 4x + 3y + 8z = 120.000 \\ 2x + 5y + 4z = 102.000 \end{cases}$$

Sehingga bisa diperoleh bentuk matriks

$$\begin{pmatrix} 5 & 2 & 6 \\ 4 & 3 & 8 \\ 2 & 5 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 117.000 \\ 120.000 \\ 102.000 \end{pmatrix}$$

Jawaban: B.

2. Bentuk matriks

$$= \begin{pmatrix} 5 & 2 & 6 \\ 4 & 3 & 8 \\ 2 & 5 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 117.000 \\ 120.000 \\ 102.000 \end{pmatrix}$$

$$\Rightarrow D = \begin{vmatrix} 5 & 2 & 6 \\ 4 & 3 & 8 \\ 2 & 5 & 4 \end{vmatrix} =$$

$$= 5 \cdot 3 \cdot 4 + 2 \cdot 8 \cdot 2 + 6 \cdot 4 \cdot 5 \\ - (6 \cdot 3 \cdot 2 + 5 \cdot 8 \cdot 5 + 2 \cdot 4 \cdot 4)$$

$$= 60 + 32 + 120 \\ - (36 + 200 + 32) \\ = -56$$

$$\bullet D_x = \begin{vmatrix} 117.000 & 2 & 6 \\ 120.000 & 3 & 8 \\ 102.000 & 5 & 4 \end{vmatrix}$$

$$= 12 \cdot 117.000 + 16 \cdot 102.000 \\ + 30 \cdot 120.000 \\ - (18 \cdot 102.000 + 40 \cdot 117.000 \\ + 8 \cdot 120.000)$$

$$= 1.170.000 + 1.632.000 + 3.600.000 - 1.836.000 - 4.680.000 - 960.000$$

$$\Rightarrow D_x = (12 - 40) \cdot 117.000 \\ + (16 - 18) \cdot 102.000 \\ + (30 - 8) \cdot 120.000 \\ = (-28) \cdot 117.000 - 204.000 \\ + 22 \cdot 120.000 \\ = (-6) \cdot 117.000 - 204.000 \\ + 22 \cdot 120.000 - 22 \cdot 117.000 \\ = -702.000 - 204.000 \\ + 22 \cdot 3.000 \\ = -840.000 + 66.000 \\ = -774.000$$

$$\bullet D_y = \begin{vmatrix} 5 & 117.000 & 6 \\ 4 & 120.000 & 8 \\ 2 & 102.000 & 4 \end{vmatrix} \\ = 20 \cdot 120.000 + 16 \cdot 117.000 \\ + 24 \cdot 102.000 \\ - (12 \cdot 120.000 + 40 \cdot 102.000 \\ + 16 \cdot 117.000) \\ = 8 \cdot 120.000 - 16 \cdot 102.000 \\ = 8 \cdot 120.000 - 8 \cdot 204.000 \\ = -8 \cdot 84.000 \\ = -672.000$$

$$\bullet D_z = \begin{vmatrix} 5 & 2 & 117.000 \\ 4 & 3 & 120.000 \\ 2 & 5 & 102.000 \end{vmatrix}$$

$$= 15 \cdot 102.000 + 4 \cdot 120.000 \\ + 20 \cdot 117.000 \\ - (6 \cdot 117.000 + 25 \cdot 120.000 \\ + 8 \cdot 102.000) \\ = 7 \cdot 102.000 + (-21) \cdot 120.000 \\ + 14 \cdot 117.000$$

## Soal Model AKM Halaman 192

$$\begin{aligned} \Rightarrow D_2 &= 7 \cdot 102.000 - 7 \cdot 360.000 \\ &\quad + 7 \cdot 234.000 \\ &= 7 \cdot (-24.000) \\ &= -168.000 \end{aligned}$$

- Pernyataan 1 (Benar)

Harga 1 soto ayam pisah lama

$$= \frac{D_1}{D} = \frac{-840.000}{-56} = 15.000$$

- Pernyataan 2 (Salah)

Harga 1 soto ayam campur

$$= \frac{D_2}{D} = \frac{-672.000}{-56} = 12.000 \neq 13.000$$

- Pernyataan 3 (Benar)

Harga 1 sate telur puyuh

$$= \frac{D_3}{D} = \frac{-168.000}{-56} = 3.000$$

- Pernyataan 4 (Benar)

Pengeluaran rombongan mobil 4

$$\begin{aligned} &= 1 \cdot 15.000 + 6 \cdot 12.000 + 7 \cdot 3.000 \\ &= 108.000 \end{aligned}$$

- Pernyataan 5 (Salah)

Pengeluaran rombongan mobil 5

$$\begin{aligned} &= 3 \cdot 15.000 + 4 \cdot 12.000 + 5 \cdot 3.000 \\ &= 108.000 \neq 180.000 \end{aligned}$$

3. Berdasarkan nomor 2. diperoleh

- Harga 1 soto ayam pisah lama  
= 15.000

- Harga 1 soto ayam campur lama  
= 12.000

- Harga 1 sate telur puyuh lama  
= 3.000

Karena kenaikan Harga = 10%

- Pernyataan 1

Pengeluaran untuk 3 soto ayam

pisah dan 2 soto ayam campur

$$= 110\% (3 \cdot 15.000 + 2 \cdot 12.000)$$

$$= 110\% (69.000)$$

$$= 75.900$$

- Pernyataan 2

Pengeluaran untuk 2 soto ayam

pisah dan 3 soto ayam campur

$$= 110\% (2 \cdot 15.000 + 3 \cdot 12.000)$$

$$= 110\% (66.000)$$

$$= 72.600$$

- Pernyataan 3

Pengeluaran untuk 4 soto ayam

pisah dan 1 soto ayam campur

$$= 110\% (4 \cdot 15.000 + 1 \cdot 12.000)$$

$$= 110\% (72.000)$$

$$= 79.200$$



o) Pernyataan 4

Pengeluaran untuk 2 soto ayam  
campur dan 2 soto ayam pisah

$$= 110\% (2 \cdot 15.000 + 2 \cdot 12.000)$$

$$= 110\% (54.000)$$

$$= 59.400$$

o) Pernyataan 5

Pengeluaran untuk 5 soto ayam  
pisah, 1 soto ayam campur, dan  
2 sate telur puyuh

$$= 110\% (5 \cdot 15.000 + 1 \cdot 12.000 \\ + 2 \cdot 3.000)$$

$$= 110\% (93.000)$$

$$= 102.300$$