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7) Hitung lokasi titik A (3,1), B (6,2), C (7,4), D (2,5) setelah dilakukannya transformasi berikut ini:

a) Translasi (-4,2)

• titik A (3,1)

$$\begin{aligned} A' (x,y) &= A + Tr \\ &= (3,1) + (-4,2) \\ &= (-1,3) \end{aligned}$$

• titik B (6,2)

$$\begin{aligned} B' (x,y) &= B + Tr \\ &= (6,2) + (-4,2) \\ &= (2,4) \end{aligned}$$

• titik C (7,4)

$$\begin{aligned} C' (x,y) &= C + Tr \\ &= (7,4) + (-4,2) \\ &= (3,6) \end{aligned}$$

• titik D (2,5)

$$\begin{aligned} D' (x,y) &= D + Tr \\ &= (2,5) + (-4,2) \\ &= (-2,7) \end{aligned}$$

b) rotasi 65°

• titik A (3,1)

$$\begin{aligned} A' &= (3 \cos 65^\circ - 1 \sin 65^\circ, 1 \cos 65^\circ + 3 \sin 65^\circ) \\ &= (3 \cdot 0,423 - 1 \cdot 0,906, 1 \cdot 0,423 + 3 \cdot 0,906) \\ &= (1,269 - 0,906, 0,423 + 2,718) = (0,363, 3,141) \end{aligned}$$

• titik B (6,2)

$$\begin{aligned} B' &= (6 \cos 65^\circ - 2 \sin 65^\circ, 2 \cos 65^\circ + 6 \sin 65^\circ) \\ &= (2,538 - 1,812, 0,846 + 5,736) = (0,726, 6,582) \end{aligned}$$

• titik C (7,4)

$$\begin{aligned} C' &= (7 \cos 65^\circ - 4 \sin 65^\circ, 4 \cos 65^\circ + 7 \sin 65^\circ) \\ &= (2,861 - 3,614, 1,692 + 6,342) \\ &= (-0,753, 8,034) \end{aligned}$$

• titik $P(2,5)$

$$P' = (2 \cos 65^\circ - 5 \sin 65^\circ, 5 \cos 65^\circ + 2 \sin 65^\circ)$$

$$= (0,846 - 4,53, 2,115 + 1,812) = (-3,684, 3,927)$$

c) skala $(2,1)$ pada titik pusat $(6,2)$

• penggeseran sebesar $(-6,-2)$

$$- A' = (3-6, 1-2) = (-3, -1)$$

$$- B' = (6-6, 2-2) = (0,0)$$

$$- C' = (7-6, 4-2) = (1,2)$$

$$- D' = (2-6, 5-2) = (-4,3)$$

• penskalaan

$$A'' = (-3 \cdot 2, -1 \cdot 3) = (-6, -3)$$

$$B'' = (0 \cdot 2, 0 \cdot 3) = (0,0)$$

$$C'' = (1 \cdot 2, 2 \cdot 3) = (2,6)$$

$$D'' = (-4 \cdot 2, 3 \cdot 3) = (-8,9)$$

• penggeseran sebesar $(6,2)$

$$A''' = (-6+6, -3+2) = (0, -1)$$

$$B''' = (0+6, 0+2) = (6,2)$$

$$C''' = (2+6, 6+2) = (8,8)$$

$$D''' = (-8+6, 9+2) = (-2,11)$$