A. Aljabar, Pangkat dan Akar

1. Bentuk Aljabar

   x, 3y, x + 3y , a+2b, $a^2 + b + 3$ disebut bentuk aljabar

   $ax^2 + bx + c = 0$; a, b, c, x dan 0 adalah lambang-lambang aljabar

   - a dan b disebut koefisien ; c disebut konstanta
   - x^2 dan x disebut variabel

   ax dan bx merupakan dua suku sejenis

   ax^2 dan bx merupakan dua suku tidak sejenis

   Unsur-unsur suku sejenis dapat digabung menjadi satu.

2. Bentuk Berpangkat

   Bentuk umum :

   $$a^n = a \; x \; a \; x \; \ldots \; x \; a \; (sebanyak \; n)$$

   Sifat-sifat :

   $$\boldsymbol{a^m \; x \; a^n} = a^{m+n}$$

   $$\boldsymbol{a^m : a^n} = a^{m-n}$$

   $$(\boldsymbol{a^m})^n = a^{m \; x \; n}$$

   $$(\boldsymbol{a \; x \; b})^m = a^m \; x \; b^m$$

   $$(\boldsymbol{a : b})^m = a^m : b^m$$

   $$\boldsymbol{a^{-m}} = \frac{1}{a^m}$$

   $$\boldsymbol{a^0} = 1$$

   $$\boldsymbol{1^m} = 1$$

3. Bentuk Akar
Sifat-sifat :

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = \sqrt[n]{a^m}$$

$$a^{\frac{1}{m}} . a^{\frac{1}{n}} = a^{\frac{1}{m}+\frac{1}{n}} = \sqrt[m]{a} . \sqrt[n]{a} = \sqrt[mn]{a^{m+n}}$$

$$a^{\frac{1}{m}} : a^{\frac{1}{n}} = a^{\frac{1}{m}-\frac{1}{n}} = \sqrt[m]{a} : \sqrt[n]{a} = \sqrt[mn]{a^{m-n}}$$

$$(a^{\frac{1}{m}})^{\frac{1}{n}} = a^{\frac{1}{m}\cdot\frac{1}{n}} = \sqrt[mn]{a}$$

$$(ab)^{\frac{1}{n}} = a^{\frac{1}{n}} . b^{\frac{1}{n}} = \sqrt[n]{ab} = \sqrt[n]{a} . \sqrt[n]{b}$$

$$(\frac{a}{b})^{\frac{1}{n}} = \frac{a^{\frac{1}{n}}}{b^{\frac{1}{n}}} = \sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$a^{-\frac{1}{n}} = (a^{\frac{1}{n}})^{-1} = \frac{1}{a^{\frac{1}{n}}} = \frac{1}{\sqrt[n]{a}}$$

$$\sqrt[n]{a^n} = (a^n)^{\frac{1}{n}} = a^{\frac{n}{n}} = a^1 = a$$

$$a\sqrt{b} + c\sqrt{b} = (a+c)\sqrt{b}$$

$$a\sqrt{b} - c\sqrt{b} = (a-c)\sqrt{b}$$

$$a\sqrt{b}\ x\ c\sqrt{d} = ac\sqrt{bd}$$

Merasionalkan Bentuk akar

$$\frac{c}{a+\sqrt{b}} = \frac{c}{a+\sqrt{b}} \cdot \frac{a-\sqrt{b}}{a-\sqrt{b}} = \frac{c(a-\sqrt{b})}{a^2-b}$$

$$\frac{c}{a-\sqrt{b}} = \frac{c}{a-\sqrt{b}} \cdot \frac{a+\sqrt{b}}{a+\sqrt{b}} = \frac{c(a+\sqrt{b})}{a^2-b}$$

$$\frac{c}{\sqrt{a}+\sqrt{b}} = \frac{c}{\sqrt{a}+\sqrt{b}} \frac{\sqrt{a}-\sqrt{b}}{\sqrt{a}-\sqrt{b}} = \frac{c(\sqrt{a}-\sqrt{b})}{a-b}$$

$$\frac{c}{\sqrt{a}-\sqrt{b}} = \frac{c}{\sqrt{a}-\sqrt{b}} \frac{\sqrt{a}+\sqrt{b}}{\sqrt{a}+\sqrt{b}} = \frac{c(\sqrt{a}+\sqrt{b})}{a-b}$$