



Lembar Kerja Peserta Didik

MATEMATIKA

EKSPONEN



class

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Standar Isi Kurikulum Merdeka

Capaian Pembelajaran



Pada akhir fase E, peserta didik dapat menggeneralisasi sifat-sifat operasi bilangan berpangkat (eksponen).

Tujuan Pembelajaran

1. Memahami sifat eksponen bentuk rasional dan bentuk akar.
2. Memahami operasi hitung bentuk akar dan bilangan rasional.



Permasalahan 1

sifat Eksponen 6
Bilangan bulat berpangkat pecahan

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}, a \neq 0$$

Contoh : Ubahlah ke dalam bentuk akar

$$\begin{aligned} 16^{\frac{3}{16}} &= (2^4)^{\frac{3}{16}} \\ &= 2^{\frac{3}{4}} \\ &= \sqrt[4]{2^3} \end{aligned}$$

Latihan: Ubahlah ke dalam pecahan sederhana

$$\begin{aligned} \sqrt[10]{243^4} &= 243^{\frac{4}{10}} \\ &= (\dots)^{\frac{\dots}{\dots}} \\ &= \dots^{\frac{\dots}{\dots}} \\ &= \dots^{\frac{\dots}{\dots}} \end{aligned}$$

Permasalahan 2

operasi hitung pada
bentuk akar

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

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

$$\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$$

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

Contoh

Tentukan nilai dari

$$7\sqrt{3} + 2\sqrt{27} = 7\sqrt{3} + 2\sqrt{3 \cdot 9}$$

$$= 7\sqrt{3} + 2 \cdot 3\sqrt{3}$$

$$= 7\sqrt{3} + 6\sqrt{3}$$

$$= 13\sqrt{3}$$

Permasalahan 2

operasi hitung pada
bentuk akar

Latihan

Tentukan nilai dari

$$7\sqrt{3} - \sqrt{75} + 2\sqrt{27}$$

$$= \dots \sqrt{\dots} + \sqrt{\dots} - \dots \sqrt{\dots}$$

$$= \dots \sqrt{\dots} + \dots \sqrt{\dots} - \dots \sqrt{\dots}$$

$$= \dots \sqrt{\dots}$$

Permasalahan 3

Merasionalkan Penyebut bentuk akar

$$\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}}$$

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

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

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

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

Contoh

Rasionalkan penyebut pada pecahan

$$\frac{4}{\sqrt{2} - \sqrt{3}} = \frac{4}{\sqrt{2} - \sqrt{3}} \times \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} + \sqrt{3}}$$

$$= \frac{4(\sqrt{2} + \sqrt{3})}{2 - 3}$$

$$= -4(\sqrt{2} + \sqrt{3})$$

Permasalahan 3

operasi hitung pada
bentuk akar

Latihan

Tentukan nilai dari

$$\frac{3}{\sqrt{2} + 2\sqrt{3}} = \frac{3}{\sqrt{2} + 2\sqrt{3}} \times \frac{\dots\dots\dots}{\dots\dots\dots}$$
$$=$$