

SIFAT-SIFAT BILANGAN BERPANGKAT

1

4

DATA DIRI

NAMA

KELAS

NO. ABSEN



3

2

Kelas VIII

ISILAH KOLOM BERWARNA HIJAU!

SIFAT 1

1. Penjumlahan

Syarat: Bilangan Pokok/Basis nya harus sama

Ex: Sederhanakan operasi bilangan berpangkat berikut:

a. $2^5 \cdot 2^4 = (2 \cdot 2 \cdot 2 \cdot 2 \cdot 2) \cdot (2 \cdot 2 \cdot 2 \cdot 2) = 2^{5+4} = 2^9$

b. $a^3 \cdot a^2 = (a \cdot a \cdot a) \cdot (a \cdot a) = a^{\quad} + \quad = a^{\quad}$

Simpulan : $a^p \cdot a^q = a^{\quad} + \quad$

2. Pengurangan

Syarat: Bilangan Pokok/Basis nya harus sama

Ex: Sederhanakan operasi bilangan berpangkat berikut:

a. $\frac{10^8}{10^6} = \frac{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10}{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10} = 10^{8-6} = 10^2$

b. $\frac{b^{10}}{b^5} = \frac{b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b}{b \cdot b \cdot b \cdot b \cdot b} = b^{\quad} - \quad = b^{\quad}$

Simpulan : $\frac{a^p}{a^q} = a^{\quad} - \quad$

SIFAT 2

3. Pangkat Nol

SIFAT 3

Syarat: Bilangan Pokok/Basis nya harus sama

Ex: Sederhanakan operasi bilangan berpangkat berikut:

$$a. \frac{12^4}{12^4} = \frac{\cancel{12} \cdot \cancel{12} \cdot \cancel{12} \cdot \cancel{12}}{\cancel{12} \cdot \cancel{12} \cdot \cancel{12} \cdot \cancel{12}} = 12^{4-4} = 12^0 = 1$$

$$b. \frac{c^7}{c^7} = \frac{\cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c}}{\cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c} \cdot \cancel{c}} = c^{\quad} - \quad = c^{\quad} = \quad$$

Simpulan : $a^0 = \quad$

4. Pangkat 1

SIFAT 4

Syarat: Bilangan Pokok/Basis nya harus sama

Ex: Sederhanakan operasi bilangan berpangkat berikut:

$$a. \frac{9^5}{9^4} = \frac{\cancel{9} \cdot \cancel{9} \cdot \cancel{9} \cdot \cancel{9} \cdot 9}{\cancel{9} \cdot \cancel{9} \cdot \cancel{9} \cdot \cancel{9}} = 9^{5-4} = 9^1 = 9$$

$$b. \frac{d^{10}}{d^9} = \frac{\cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot d}{\cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d} \cdot \cancel{d}} = d^{\quad} - \quad = d^{\quad} = \quad$$

Simpulan : $a^1 = \quad$

5. Pangkat Negatif

Ex: Sederhanakan operasi bilangan berpangkat berikut:

$$a. \frac{3^4}{3^6} = \frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3}}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3} = 3^{4-6} = 3^{-2} = \frac{1}{3^2}$$

$$b. \frac{e^2}{e^7} = \frac{\cancel{e} \cdot \cancel{e}}{\cancel{e} \cdot \cancel{e} \cdot \cancel{e} \cdot \cancel{e} \cdot \cancel{e} \cdot \cancel{e} \cdot e} = e^{\quad} - \quad = e^{\quad} = \frac{\quad}{e^{\quad}}$$

Simpulan : $a^{-p} = \frac{\quad}{a^{\quad}} \quad (a \neq 0)$

SIFAT 5

SIFAT 6

6. Perkalian

Ex: Sederhanakan operasi bilangan berpangkat berikut:

a. $(5^3)^4 = (5^3) \cdot (5^3) \cdot (5^3) \cdot (5^3) = (5 \cdot 5 \cdot 5) \cdot (5 \cdot 5 \cdot 5) \cdot (5 \cdot 5 \cdot 5) \cdot (5 \cdot 5 \cdot 5) = 5^{3 \cdot 4} = 5^{12}$

b. $(f^2)^3 = (f^2) \cdot (f^2) \cdot (f^2) = (f \cdot f) \cdot (f \cdot f) \cdot (f \cdot f) = f \cdot f \cdot f \cdot f \cdot f \cdot f = f^{2 \cdot 3} = f^6$

Simpulan : $(a^p)^q = a^{p \cdot q}$

7. Penyederhanaan Pangkat bentuk Kali : $(a \cdot b)^p = a^p \cdot b^p$

Example: Sederhanakan operasi bilangan berpangkat di bawah ini:

a. $35^4 = (5 \cdot 7)^4 = 5^4 \cdot 7^4$

b. $(m^5 \cdot n^2)^{10} = (m^5)^{10} \cdot (n^2)^{10} = m^{50} \cdot n^{20}$

SIFAT 7

8. Penyederhanaan Pangkat bentuk Bagi : $\left(\frac{a}{b}\right)^p = \frac{a^p}{b^p}$

Example: Sederhanakan operasi bilangan berpangkat di bawah ini:

a. $\left(\frac{28}{15}\right)^4 = \left(\frac{2^2 \cdot 7}{3 \cdot 5}\right)^4 = \frac{(2^2)^4 \cdot 7^4}{3^4 \cdot 5^4} = \frac{2^8 \cdot 7^4}{3^4 \cdot 5^4}$

b. $\left(\frac{p^3 \cdot q}{r^5}\right)^{20} = \frac{(p^3)^{20} \cdot q^{20}}{(r^5)^{20}} = \frac{p^{60} \cdot q^{20}}{r^{100}}$

SIFAT 8

LATIHAN SOAL

ISILAH KOLOM BERWARNA HIJAU!

1

$$r^{\boxed{}} = r$$

2

$$p^{12} \cdot p^{\boxed{}} = p^{19}$$

3

$$18^{\boxed{}} \div 18^2 = 18^6$$

4

$$5^{\boxed{}} = \frac{1}{5^{10}}$$

5

$$(b^{\boxed{}} \cdot c^4)^{-2} = b^{-6} \cdot c^{\boxed{}}$$

6

$$\frac{k^{\boxed{}}}{k^{-3}} = k^{17}$$

7

$$\left(\frac{2^3}{3^{\boxed{}}}\right)^{-1} = \frac{2^{-3}}{3^{-5}}$$

8

$$(x^{25})^{\boxed{}} = x^{100}$$