

1. PENJABARAN DAN PENFAKTORAN

A. PERKALIAN

$$a(b + c) = ab + ac$$

$$(b + c)a = ab + ac$$

$$\begin{aligned} 3x(x + 5) \\ = 3x(x) + 3x(5) \\ = 3x^2 + 15x \end{aligned}$$

$$\begin{aligned} (5a - 3) \times (-2a) \\ = 5a(-2a) - 3(-2a) \\ = -10a^2 + 6a \end{aligned}$$

Soal 1

Hitunglah.

(1) $a(a + 3)$

(2) $-4x(2x - 5)$

(3) $(-3a + 1) \times 6a$

(4) $(2x + 4y)(-y)$

(5) $2a(a^2 + 2a - 3)$

(6) $(6x - 9) \times \frac{2}{3}x$

B. PEMBAGIAN

$$\frac{a \times \cancel{a}}{\cancel{a}} + \frac{6\cancel{a}}{\cancel{a}} = a + 6$$

1. $(a^2 + 6a) : a$

$$\begin{aligned} &= (a^2 + 6a) \times \frac{1}{a} \\ &= a^2 \left(\frac{1}{a}\right) + 6a \left(\frac{1}{a}\right) \\ &= \left(\frac{a^2}{a}\right) + \left(\frac{6a}{a}\right) \\ &= \left(\frac{a \times a}{a}\right) + \left(\frac{6a}{a}\right) \\ &= a + 6 \end{aligned}$$

$$\frac{1}{2}y = \frac{y}{2}$$

Kebalikan dari $\frac{1}{2}y$ adalah $\frac{2}{y}$

2. $(xy - 4y^2) : \frac{1}{2}y$

$$\begin{aligned} &= (xy - 4y^2) \times \frac{2}{y} \\ &= xy \left(\frac{2}{y}\right) - 4y^2 \left(\frac{2}{y}\right) \\ &= \left(\frac{2xy}{y}\right) - \left(\frac{2 \times 4y \times y}{y}\right) \end{aligned}$$

$$= 2x - 8y$$

Soal 2

Hitunglah.

(1) $(10x^2 + 7x) : x$

(2) $(8a^2b - 2ab^2) : 2ab$

(3) $(4x^2 - 6xy) : \frac{2}{3}x$

(4) $(-2ab + a) : \left(\frac{a}{4}\right)$

2. MENJABARKAN BENTUK ALJABAR

$$(a + b)(c + d) = ac + ad + bc + db$$

$$\begin{aligned} 1. (x + 1)(y + 3) \\ = xy + 3x + y + 3 \end{aligned}$$

$$\begin{aligned} 2. (a - 3)(b + 2) \\ = ab + 2a - 3b - 6 \end{aligned}$$

Soal 3

Jabarkan

$$(1) (a + 3)(b + 5)$$

$$(2) (x - 2)(y + 6)$$

$$(3) (a + b)(c - d)$$

$$(4) (x - a)(y - b)$$

Sifat-sifat operasi akar bilangan

$$1. \sqrt{a} + \sqrt{a} = 2\sqrt{a}$$

$$\text{Contoh : } \sqrt{5} + \sqrt{5} = 2\sqrt{5}$$

$$2. k\sqrt{a} + l\sqrt{a} = (k + l)\sqrt{a}$$

$$\text{Contoh : } 4\sqrt{3} + 5\sqrt{3} = (4 + 5)\sqrt{3} = 9\sqrt{3}$$

$$3. \sqrt{a} \times \sqrt{a} = \sqrt{a^2} = a$$

$$\text{Contoh : } \sqrt{6} \times \sqrt{6} = \sqrt{6^2} = 6$$

$$4. k\sqrt{a} \times l\sqrt{a} = akl$$

$$\text{Contoh : } 7\sqrt{2} \times 3\sqrt{2} = 2 \times 7 \times 3 = 42$$

$$5. \sqrt{a} + \sqrt{b} = \sqrt{a} + \sqrt{b}$$

$$\text{Contoh : } \sqrt{3} + \sqrt{7} = \sqrt{3} + \sqrt{7}$$

$$6. k\sqrt{a} + l\sqrt{b} = k\sqrt{a} + l\sqrt{b}$$

$$\text{Contoh : } 2\sqrt{3} + 5\sqrt{6} = 2\sqrt{3} + 5\sqrt{6}$$

$$7. \sqrt{a} \times \sqrt{b} = \sqrt{ab}$$

Contoh :

$$8. k\sqrt{a} \times l\sqrt{b} = kl\sqrt{ab}$$

$$9. \sqrt{a} - \sqrt{b} = \sqrt{a} - \sqrt{b}$$

10. $k\sqrt{a} - la = (k - l)\sqrt{a}$
11. $k\sqrt{a} - l\sqrt{b} = k\sqrt{a} - l\sqrt{b}$
12. $\sqrt[m]{a^n} = a^{\frac{n}{m}}$
13. $\sqrt{a} : \sqrt{a} = \sqrt{\frac{a}{a}} = \sqrt{1} = 1$
14. $\sqrt{a} : \sqrt{b} = \sqrt{\frac{a}{b}}$
15. $k\sqrt{a} : l\sqrt{a} = a \frac{k}{l}$
16. $k\sqrt{a} : l\sqrt{b} = \frac{k}{l} \sqrt{\frac{a}{b}}$
17. $\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b}$
18. $\frac{a}{b+\sqrt{c}} = \frac{a}{b+\sqrt{c}} \times \frac{b-\sqrt{c}}{b-\sqrt{c}} = \frac{a(b-\sqrt{c})}{b^2-c}$
19. $\frac{a}{b-\sqrt{c}} = \frac{a}{b-\sqrt{c}} \times \frac{b+\sqrt{c}}{b+\sqrt{c}} = \frac{a(b+\sqrt{c})}{b^2+c}$
20. $\frac{a}{\sqrt{b}+\sqrt{c}} = \frac{a}{\sqrt{b}+\sqrt{c}} \times \frac{\sqrt{b}-\sqrt{c}}{\sqrt{b}-\sqrt{c}} = \frac{a(\sqrt{b}-\sqrt{c})}{b^2-c^2}$
21. $\frac{a}{\sqrt{b}-\sqrt{c}} = \frac{a}{\sqrt{b}-\sqrt{c}} \times \frac{\sqrt{b}+\sqrt{c}}{\sqrt{b}+\sqrt{c}} = \frac{a(\sqrt{b}+\sqrt{c})}{b^2+c^2}$