1. PENJABARAN DAN PENFAKTORAN

A. PERKALIAN

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

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

$3x(x + 5)$
$= 3x(x) + 3x(5)$
$=3x^2 + 15x$

$(5a - 3) \times (-2a)$
$= 5a(-2a) - 3(-2a)$
$= -10a^2 + 6a$

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

B. PEMBAGIAN

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

1. $(a^2 + 6a) : a$
$= (a^2 + 6a) \times \dfrac{1}{a}$
$= a^2 \left(\dfrac{1}{a}\right) + 6a\left(\dfrac{1}{a}\right)$
$= \left(\dfrac{a^2}{a}\right) + \left(\dfrac{6a}{a}\right)$
$= \left(\dfrac{a \times a}{a}\right) + \left(\dfrac{6a}{a}\right)$
$= a + 6$

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

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

2. $(xy - 4y^2) : \dfrac{1}{2}y$
$= (xy - 4y^2) \times \dfrac{2}{y}$
$= xy\left(\dfrac{2}{y}\right) - 4y^2\left(\dfrac{2}{y}\right)$
$= \left(\dfrac{2xy}{y}\right) - \left(\dfrac{2 \times 4y \times y}{y}\right)$
$= 2x - 8y$

Soal 2

Hitunglah.

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

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

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

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

2. MENJABARKAN BENTUK ALJABAR

$$(a + b)(c + d) = \boxed{ac} + \boxed{ad} + \boxed{bc} + \boxed{db}$$

1. $(x + 1)(y + 3)$
$= xy + 3x + y + 3$

2. $(a - 3)(b + 2)$
$= ab + 2a - 3b - 6$

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

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

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

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

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

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

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

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

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

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

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

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