

Letterrekenen

Haakjes met hogere machten uitwerkingen

Voorbeelden:

$$(y^4)^5 = y^4 \cdot y^4 \cdot y^4 \cdot y^4 \cdot y^4 = y^{20}$$

$$(-3b^2)^3 = -3b^2 \cdot -3b^2 \cdot -3b^2 = -27b^6$$

Opgave 5.1

Herleid.

a) $(y^3)^4 = y^{12}$

b) $(x^7)^3 = x^{21}$

c) $(x^5)^5 = x^{25}$

d) $(ab)^5 = a^5b^5$

e) $(3a^2)^4 = 81a^8$

f) $(-3a)^4 = 81a^4$

g) $(2ab^2)^3 = 8a^3b^6$

h) $-(ab^2)^4 = -a^4b^8$

Opgave 5.2

Herleid.

a) $(abc)^4 = a^4b^4c^4$

b) $(-3b)^3 = -27b^3$

c) $(-x^2)^3 = -x^6$

d) $(-2xy)^5 = -32x^5y^5$

e) $-(5p^3y^3)^3 = -125p^9y^9$

f) $(2a^2b)^5 = 32a^{10}b^5$

g) $-3(a^2)^3 = -3a^6$

h) $2(a^2b^3)^4 = 2a^8b^{12}$

Opgave 5.3

Herleid.

a) $(-2a^4)^3 \cdot (a^3)^2 = -8a^{12} \cdot a^6 = -8a^{18}$

b) $-(3b^3)^3 \cdot (2b)^4 = -27b^9 \cdot 16b^4 = -432b^{13}$

c) $-3(a^4)^2 \cdot (2a^2)^5 = -3a^8 \cdot 32a^{10} = -96a^{18}$

d) $(-2q)^4 \cdot (ab)^5 = 16q^4 \cdot a^5b^5 = 16a^5b^5q^4$

e) $(6x^6)^2 + 3(x^3)^2 = 36x^{12} + 9x^6$

f) $(3y^4)^3 + 4(y^2)^6 = 27y^{12} + 4y^{12} = 31y^{12}$

g) $(4a^8)^2 + -7(x^4)^4 = 16a^{16} - 7x^{16} = 9x^{16}$

h) $6(p^2)^7 + (-2p^5)^4 = 6p^{14} + 16p^{20}$

Opgave 5.4

Herleid.

a) $(-x^2)^3 \cdot (5x^3)^2 = -x^6 \cdot 25x^6 = -25x^{12}$

b) $(-3a^3)^3 \cdot (a^{10}b)^3 = -27a^9 \cdot a^{30}b^3 = -27a^{39}b^3$

c) $(9y^5)^2 \cdot (a^2y^{11})^5 = 81y^{10} \cdot a^{10}y^{55} = 81a^{10}y^{65}$

d) $(-2q)^4 \cdot (a^3q^3)^5 = 16q^4 \cdot a^{15}q^{15} = 16a^{15}q^{19}$

e) $(7ax^6)^2 + 3(5ax^3)^2 = 49a^2x^{12} + 3 \cdot 25a^2x^6 = 49a^2x^{12} + 75a^2x^6$

f) $-3(p^4)^3 - 4(py^2)^6 = -3p^{12} - 4p^6y^{12}$

g) $(8a^8)^2 - 10(x^4)^4 = 64a^{16} - 10x^{16}$

h) $7(p^2)^{10} + (-p^4)^5 = 7p^{20} - p^{20} = 6p^{20}$

Opgave 5.5

Herleid.

$$\text{a) } (3xy)^2 + 6x^2y^2 = 9x^2y^2 + 6x^2y^2 = 15x^2y^2$$

$$\text{b) } -(3a^3)^2 - (2a^2)^3 = -9a^6 - 8a^6 = -17a^6$$

$$\text{c) } -3(p^4)^{15} \cdot 5(p^7)^5 = -3p^{60} \cdot 5p^{35} = -3p^{95}$$

$$\text{d) } (-q)^3 \cdot 3(a^2b)^5 = -q^3 \cdot 3a^{10}b^5 = -3a^{10}b^5 q^3$$

$$\text{e) } -5(p^6y)^2 \cdot 4(p^2y)^5 = -5p^{12}y^2 \cdot 4p^{10}y^5 = -20p^{22}y^7$$

$$\text{f) } 6(a^4y^4)^3 - 4(a^2y^2)^6 = 6a^{12}y^{12} - 4a^{12}y^{12} = 2a^{12}y^{12}$$

$$\text{g) } -7(a^3)^4 \cdot -7(x^5)^4 = -7a^{12} \cdot -7x^{20} = 49a^{12}x^{20}$$

$$\text{h) } 9(p^2)^8 + (-2p^6)^3 = 9p^{16} - 2p^{18}$$