Solutions des exercices *J'applique* (p. 63)

1

$A = 9^5$

$B = \left(\frac{2}{5}\right)^4$

$C = (-6)^6$

2

a. $3^4 = 3 \times 3 \times 3 \times 3 = 81$

b. $(-3)^4 = (-3) \times (-3) \times (-3) \times (-3) = 81$

c. $-3^4 = -3 \times 3 \times 3 \times 3 = -81$

d. $3^{-4} = \frac{1}{3^4} = \frac{1}{3 \times 3 \times 3 \times 3} = \frac{1}{81}$

e. $(-3)^{-4} = \frac{1}{(-3)^4}$

$= \frac{1}{(-3) \times (-3) \times (-3) \times (-3)} = \frac{1}{81}$

f. $-3^{-4} = -\frac{1}{3^4} = -\frac{1}{3 \times 3 \times 3 \times 3} = -\frac{1}{81}$

3

a. $3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

b. $(-2)^6$

$= (-2) \times (-2) \times (-2) \times (-2) \times (-2) \times (-2)$

$= 64$

c. $\left(\frac{1}{4}\right)^3 = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{64}$

d. $(0{,}1)^3 = 0{,}1 \times 0{,}1 \times 0{,}1 = 0{,}001$

e. $(-0{,}1)^3 = (-0{,}1) \times (-0{,}1) \times (-0{,}1)$

$= -0{,}001$

f. $10^7 = 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$

$= 10\,000\,000$

g. $190^1 = 190$

h. $(-9)^1 = -9$

i. $0^1 = 0$

j. $(-256)^0 = 1$

k. $6^{-1} = \frac{1}{6^1} = \frac{1}{6}$

l. $-5^4 = -5 \times 5 \times 5 \times 5 = -625$

4

a. $10^4 \times 10^3 = 10^{4+3} = 10^7$

b. $4^7 \times 4^2 = 4^{7+2} = 4^9$

c. $(-5)^3 \times (-5)^{-2} = (-5)^{3+(-2)} = (-5)^1$

d. $7 \times 7^3 \times 7^{-3} = 7^{1+3+(-3)} = 7^1$

e. $\frac{10^4}{10^3} = 10^{4-3} = 10^1$

f. $\frac{4^7}{4^2} = 4^{7-2} = 4^5$

g. $\frac{(-5)^3}{(-5)^{-2}} = (-5)^{3-(-2)} = (-5)^{3+2} = (-5)^5$

h. $\frac{7 \times 7^3}{7^{-3}} = \frac{7^{1+3}}{7^{-3}} = \frac{7^4}{7^{-3}} = 7^{4-(-3)} = 7^{4+3} = 7^7$

i. $\left(10^4\right)^3 = 10^{4 \times 3} = 10^{12}$

j. $\left(4^7\right)^2 = 4^{7 \times 2} = 4^{14}$

k. $\left((-5)^3\right)^{-2} = (-5)^{3 \times (-2)} = (-5)^{-6}$

l. $(7 \times 7^3)^{-3} = (7^{1+3})^{-3} = (7^4)^{-3} = 7^{4 \times (-3)} = 7^{-12}$

5

a. $2^5 \times 5^5 = (2 \times 5)^5 = 10^5$

b. $(-3)^4 \times 2^4 = (-3 \times 2)^4 = (-6)^4$

c. $10^{-7} \times 2^{-7} = (10 \times 2)^{-7} = 20^{-7}$

d. $(-2)^{-3} \times (-3)^{-3} = ((-2) \times (-3))^{-3} = 6^{-3}$

e. $\frac{2^5}{5^5} = \left(\frac{2}{5}\right)^5$

f. $\frac{(-3)^4}{2^4} = \left(-\frac{3}{2}\right)^4$

g. $\frac{10^{-7}}{2^{-7}} = \left(\frac{10}{2}\right)^{-7} = 5^{-7}$

h. $\frac{(-2)^{-3}}{(-3)^{-3}} = \left(\frac{-2}{-3}\right)^{-3} = \left(\frac{2}{3}\right)^{-3}$

6

a. $2^{40} \div 2 = 2^{40-1} = 2^{39}$

b. $2^{40} \times 2 = 2^{40+1} = 2^{41}$

c. $(2^2)^3 = 2^{2 \times 3} = 2^6 = 64$

d. $(2^3)^2 = 2^{3 \times 2} = 2^6 = 64$

7

a. $1 + 3^2 = 1 + 3 \times 3 = 1 + 9 = 10 \rightarrow$ Faux.

b. $5 \times 2^3 = 5 \times 2 \times 2 \times 2 = 40 \rightarrow$ Vrai.

c. $\frac{5^2}{4} = \frac{5 \times 5}{4} = \frac{25}{4} \rightarrow$ Vrai.

d. $(2 + 3)^4 = 5^4 = 625$

$2^4 + 3^4 = 16 + 81 = 97 \rightarrow$ Faux.

8

a. $2{,}094\,35 \times 10^3$

b. 5×10^3

c. $2{,}34 \times 10^2$

d. $2{,}17 \times 10^2$

e. $1{,}092\,7 \times 10^2$

9

1. a. 150 000 000 km = 150 000 000 000 m
$= 1{,}5 \times 10^{11}$ m

b. 5 mm = 0,005 m = 5×10^{-3} m

c. 0,14 nm = $0{,}14 \times 10^{-9}$ m = $1{,}4 \times 10^{-10}$ m

d. 7 µm = 7×10^{-6} m

e. 6 400 km = 6 400 000 m = $6{,}4 \times 10^6$ m

2. 1–e ; 2–b ; 3–d ; 4–a ; 5–c.