

PUISSANCES DE 10

EXERCICE 3

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EXERCICE 1 :

$$A = 10^4 \times 10^{-8} \times 10^5 = 10^{4-8+5} = 10^1$$

$$B = (10^{-2})^3 \times (10^3)^4 = 10^{-2 \times 3} \times 10^{3 \times 4} = 10^{-6} \times 10^{12} = 10^6$$

$$C = \frac{10^4 \times 10^{-1} \times 10^{-5}}{10^{-7} \times 10^6 \times 10^{-3}} = \frac{10^{4-1-5}}{10^{-7+6-3}} = \frac{10^{-2}}{10^{-4}} = 10^{-2-(-4)} = 10^2$$

$$D = \frac{(10^{-5})^6}{(10^4)^{-8}} = \frac{10^{-5 \times 6}}{10^{4 \times (-8)}} = \frac{10^{-30}}{10^{-32}} = 10^{-30-(-32)} = 10^2$$

$$E = \frac{10^4}{10^{-3}} = \frac{10^4}{10^{-5}} \times \frac{10^2}{10^{-3}} = \frac{10^{4+2}}{10^{-5-3}} = \frac{10^6}{10^{-8}} = 10^{6-(-8)} = 10^{14}$$

$$F = \left(\left((10^{-2})^3 \right)^{-4} \right)^{-1} = \left((10^{-2 \times 3})^{-4} \right)^{-1} = \left(10^{-6 \times (-4)} \right)^{-1} = 10^{24 \times (-1)} = 10^{-24}$$

EXERCICE 2

$$A = 10^{-2} \times 10^9 \times 10 \times 10^2 \times 10^{-5} = 10^{-2+9+1+2-5} = 10^5$$

$$B = \frac{10^6}{10^{-2}} \times \frac{10^{-2}}{10^{-5}} \times \frac{10^{-5}}{10^4} = 10^{6-(-2)} \times 10^{-2-(-5)} \times 10^{-5-4} = 10^{6+2} \times 10^{-2+5} \times 10^{-9} = 10^8 \times 10^3 \times 10^{-9} = 10^2$$

$$C = 10^4 \times \frac{10^6}{10^9} \times \frac{10^{-4}}{10^0} \times \frac{1}{10^5} = 10^4 \times 10^{6-9} \times 10^{-4-0} \times 10^{-5} = 10^4 \times 10^{-3} \times 10^{-4} \times 10^{-5} = 10^{4-3-4-5} = 10^{-8}$$

$$D = \frac{(10^{-2})^3 \times (10^{-8})^{-2}}{(10^{-1})^4 \times (10^{-5})^3} = \frac{10^{-2 \times 3} \times 10^{-8 \times (-2)}}{10^{-1 \times 4} \times 10^{-5 \times 3}} = \frac{10^{-6} \times 10^{16}}{10^{-4} \times 10^{-15}} = 10^{-6-(-4)} \times 10^{16-(-15)} = 10^{-6+4} \times 10^{16+15} = 10^{-2} \times 10^{31} = 10^{-2+31} = 10^{29}$$

$$E = (10^{-9} \times 10^{-3} \times 10^{14} \times 10 \times 0,1)^{-2} = (10^{-9-3+14} \times 1)^{-2} = (10^2)^{-2} = 10^{2 \times (-2)} = 10^{-4}$$

$$F = \left[\frac{10^{-3}}{10^{-5}} \times \left(\frac{10^1}{10^{-1}} \right)^{-3} \right]^{-5} = \left[10^{-3-(-5)} \times \left(10^{1-(-1)} \right)^{-3} \right]^{-5} = \left[10^{-3+5} \times \left(10^{1+1} \right)^{-3} \right]^{-5} = \left[10^2 \times \left(10^2 \right)^{-3} \right]^{-5} = \left[10^2 \times 10^{2 \times (-3)} \right]^{-5} = \left[10^2 \times 10^{-6} \right]^{-5} = \left[10^{2-6} \right]^{-5} = \left[10^{-4} \right]^{-5} = 10^{-4 \times (-5)} = 10^{20}$$

EXERCICE 3 : Compléter les pointillés :

$10^4 \times 10^{-5} = 10^{-1}$	$10^{-5} \times 10^{10} \times 10^{-2} = 10^3$
$\frac{1}{10^{-6}} = 10^6$	$\frac{10^{-3}}{10^2} = 10^{-5}$
$\frac{10^{-4} \times 10^9}{10^{-1} \times 10^{-2}} = 10^8$	$\frac{10^{-1} \times 10^5 \times 10^{-1}}{10^{-3} \times 10^7 \times 10^2} = 10^{-3}$
$(10^3)^{-2} = 10^{-6}$	$(10^{-3})^{-4} = 10^{12}$
$\left[(10^{-1})^{-3} \right]^{-3} = 10^{-9}$	$\frac{1}{(10^{-5})^3} = 10^{15}$
$10^{11} \times 10^{-7} = 10^{-5} \times 10^9$	$\frac{10^{-3}}{10^{-7}} = \frac{10^{-5}}{10^{-9}}$

EXERCICE 4

a. $54\,321,098\,76 \times 10^2 = 5\,432\,109,876$
b. $54\,321,098\,76 \times 10^{-2} = 543,210\,987\,6$
c. $54\,321,098\,76 \times 10^4 = 543\,210\,987,6$
d. $54\,321,098\,76 \times 10^{-3} = 54,321\,098\,76$
e. $54\,321,098\,76 \times 10^5 = 5\,432\,109\,876$
f. $54\,321,098\,76 \times 10^{-4} = 5,432\,109\,876$
g. $54\,321,098\,76 \times 10^{-1} = 5\,432,109\,876$
h. $54\,321,098\,76 \times 10^7 = 543\,210\,987\,600$
i. $54\,321,098\,76 \times 10^{-6} = 0,054\,321\,098\,76$
j. $54\,321,098\,76 \times 10^0 = 54\,321,098\,76$

EXERCICE 5

a. $6,08 \times 10^5 = 608\,000$
b. $-87,52 \times 10^3 = -87\,520$

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$$c. 8,0002 \times 10^3 = \mathbf{8\ 000,2}$$

$$d. 0,00875 \times 10^7 = \mathbf{87\ 500}$$

$$e. 67,04 \times 10^{-1} = \mathbf{6,704}$$

$$f. -965,297 \times 10^{-2} = \mathbf{-9,652\ 97}$$

$$g. -6,153372 \times 10^4 = \mathbf{-61\ 533,72}$$

$$h. 807,5 \times 10^{-5} = \mathbf{0,008\ 075}$$

$$i. 953\ 000\ 000 \times 10^{-5} = \mathbf{9\ 530}$$

$$j. -41\ 765\ 300 \times 10^{-2} = \mathbf{-417\ 653}$$

EXERCICE 6

Compléter les pointillés :

$$a. 6,08 \times 10^{\dots} = 608\ 000$$

$$b. 87,52 \times 10^1 = 875,2$$

$$c. 764,987 \times 10^{-2} = 7,64987$$

$$d. 9\ 875 \times 10^4 = 98\ 750\ 000$$

$$e. 49\ 518 \times 10^{-5} = 0,495\ 18$$

$$f. 642,063\ 2 \times 10^6 = 642\ 063\ 200$$

$$g. 40\ 328,16 \times 10^{-9} = 0,000\ 040\ 328\ 16$$

$$h. 923,923 \times 10^{10} = 9\ 239\ 230\ 000\ 000$$

$$i. 328\ 143,684 \times 10^{-13} = 0,000\ 000\ 032\ 814\ 368\ 4$$

$$j. 32,81 \times 10^{20} = 3\ 281\ 000\ 000\ 000\ 000\ 000\ 000$$