

Activité 2: Puissances à exposants négatifs P72

NAM P54

c)

Devoir

$3^{-6} = \frac{1}{3^6} = \frac{1}{9}$	$5^{-3} = \frac{1}{5^3} = \frac{1}{125}$	$7^{-2} = \frac{1}{7}$	$(-2)^{-2} = \frac{-1}{2}$	$(-2)^{-5} = \frac{-1}{2^5} = \frac{-1}{32}$
$(-3)^{-4} = \frac{1}{3^4} = \frac{1}{81}$	$(\frac{1}{2})^{-1} = \frac{2}{1} = 2$	$(\frac{2}{3})^{-1} = \frac{3}{2}$	$(\frac{5}{3})^{-3} = (\frac{3}{5})^3 = \frac{27}{125}$	$(\frac{-1}{10})^{-7}$

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Activité 3: Transformations d'écritures P73.

a) 1) $a^{-5} = \frac{1}{a^5}$	$a^3 b^{-7} = \frac{a^3}{b^7}$	$a^6 \cdot b^{-5} = \frac{1}{a^6 b^5}$	$a \cdot b^4 \cdot c^3 = \frac{ab^2}{c^2}$
2) $5 \cdot a^3 \cdot b^{-3} = \frac{5 \cdot a^4}{b^3}$	$-4 \cdot a^{-2} \cdot b^{-2} = \frac{-4}{a^2 b^2}$	$5 \cdot a^{-2} \cdot b^3 = \frac{5b^3}{a}$	$3ab^{-5} = \frac{3a}{b^5}$
3) $2a^3 b^{-5} = \frac{2a^3}{b^5}$	$-2a^3 b^4 = \frac{-2b^2}{a^3}$	$3a^{-2} b^{-3} = \frac{3}{a^2 b^3}$	$-5a^{-2} b^{-2} = \frac{-5}{a^2 b}$
4) $\frac{1}{b^{-3}} = b^3$	$\frac{1}{a^{-8}} = a^8$	$\frac{a^3}{b^{-2}} = a^3 b^2$	$\frac{a^{-5}}{b^{-4}} = \frac{b^4}{a^5}$
5) $\frac{5}{a^{-3}} = 5a^3$	$\frac{2b}{3a^{-4}} = \frac{2b \cdot a^4}{3}$	$\frac{a}{b^2 c^{-3}} = \frac{a \cdot c^3}{b^2}$	$\frac{-3}{a^2 c^{-4}} = \frac{-3c^4}{a^2}$
6) $\frac{3a^4 b^{-2}}{6c^{-2}} = \frac{1}{2} \frac{a^4 c^2}{b} = \frac{a^4 c^2}{2b}$	$\frac{8a^{-2} b^{-3}}{c^{-3}} = \frac{8c^3}{a^2 b^3}$	$\frac{4c^{-2}}{6a^{-2}} = \frac{2}{3} \frac{a}{c}$	$\frac{-8a^{-2}}{-5b^2 c^{-3}} = \frac{8c^3}{5b^2 a}$

b) Rendre les exposants positifs.

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$(-7)^6 = 49$	$6^{-2} = \frac{1}{36}$	$5^{-3} = \frac{1}{125}$	$(-4)^{-2} = \frac{1}{16}$	$(-3)^{-5} = \frac{-1}{243} = \frac{-1}{243}$
$5^2 = 25$	$(-5)^6 = 25$	$5^{-2} = \frac{1}{25}$	$(-5)^{-2} = \frac{1}{25}$	$-5^6 = -25$
$\frac{3}{4^{-2}} = 3 \cdot 16 = 48$	$\frac{8}{2^{-2}} = 8 \cdot 8 = 64$	$\frac{2^{-3}}{5^{-2}} = \frac{1}{8} \cdot \frac{1}{25} = \frac{1}{200}$	$\frac{4^{-6}}{2^3} = \frac{1}{8 \cdot 16} = \frac{1}{128}$	$\frac{5^{-2}}{2^{-2}} = \frac{8}{25}$
$\frac{5^3}{5^{-2}} = 5^3 \cdot 5^2 = 5^5 = 3125$	$\frac{3^{-6}}{3^{-4}} = \frac{3^4}{3^6} = \frac{1}{3^2} = \frac{1}{9}$	$\frac{2^{-5}}{2^2} = \frac{1}{2^7} = \frac{1}{128}$	$\frac{4^{-2}}{4} = \frac{1}{4^3} = \frac{1}{64}$	$\frac{2^4}{2^3} = 2$

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b)

$a^3 \cdot a^{-5} = a^{-2} = \frac{1}{a^2}$ ⁽¹⁾	$\frac{a^7}{a^2} = a^5$ ⁽²⁾	$\frac{a^{-3}}{a^{-3}} = 1$ ⁽³⁾	$(a^4)^{-3} = a^{-12} = \frac{1}{a^{12}}$ ⁽⁴⁾	$(a^{-4})^{-2} = a^8$ ⁽⁵⁾
$a^{-4} \cdot a^{-2} = a^{-6} = \frac{1}{a^6}$	$\frac{a^6}{a^{-2}} = a^8$	$\frac{3a^4}{a^{-4}} = 3a^8$	$(b^4)^{-2} = b^{-8} = \frac{1}{b^8}$	$(b^7)^{-3} = b^{-21} = \frac{1}{b^{21}}$
$a^7 \cdot a^{-2} = a^5$	$\frac{a^{-5}}{a^{-2}} = \frac{1}{a^3}$	$\frac{5a^{-3}}{4a^{-2}} = \frac{5}{4a}$	$(d^{-2})^{-4} = d^8$	$(ab)^{-2} = \frac{1}{a^2 b^2}$
$a^4 \cdot a^{-4} = a^0 = 1$	$\frac{a^{-2}}{a^3} = \frac{1}{a^5}$	$\frac{-2a^{-4}}{3a^3} = \frac{-2}{3a^7}$	$(c^{-3})^{-2} = c^6$	$(ab^{-2})^{-3} = a^{-2} b^6 = \frac{b^6}{a^2}$

$(2a)^{-5} = \frac{1}{(2 \cdot 2)^5} = \frac{1}{32 \cdot 2^5}$ ⁽⁶⁾	$(-2ab^{-4})^{-3} = \frac{-b^3}{8a^3}$ ⁽⁷⁾	$\left(\frac{a}{b}\right)^{-3} = \frac{b^3}{a^3}$ ⁽⁸⁾
$(3a)^{-3} = \frac{1}{27a^3}$	$(-4ab^{-2})^{-3} = \frac{-64a^3}{b^6}$	$\left(\frac{a}{b^{-2}}\right)^{-4} = (ab^2)^{-4} = \frac{1}{a^4 b^8}$
$(5a^{-3})^{-6} = \frac{a^6}{25}$	$(-2ab^{-2})^{-4} = \frac{b^4}{16a^4}$	$\left(\frac{b^{-2}}{a}\right)^{-3} = \frac{b^6}{a^{-3}} = a^3 b^6$
$(4a^3 b^{-2})^{-6} = 4^{-6} a^{-18} b^{12} = \frac{b^{12}}{16a^{18}}$	$(ab^{-2})^{-2} = \frac{b}{a}$	$\left(\frac{1}{a^{-3}}\right)^{-2} = \frac{1^{-2}}{a^6} = \frac{1}{a^6}$

c)

$x^4 \cdot x^3 = x^7$	$a^5 \cdot a^{-2} = a^3$	$b^4 \cdot b^4 = b^8$	$b^{-4} \cdot b^{-4} = b^{-8} = \frac{1}{b^8}$
$x^{-2} \cdot x^3 = x$	$a^5 \cdot (-a^4) = -a^9$	$b^4 \cdot b^{-4} = b^0 = 1$	$-b^4 \cdot b^{-4} = -b^0 = -1$
$x^{-2} \cdot x^{-3} = x^{-5} = \frac{1}{x^5}$	$-a^5 \cdot a^{-2} = -a^3$	$-b^4 \cdot b^4 = -b^8$	$b^4 \cdot (-b)^4 = +b^8$
$-x^4 \cdot x^3 = -x^7$	$-a^5 \cdot (-a)^2 = -a^8$	$-b^4 \cdot (-b^4) = b^8$	$b^4 \cdot (-b^{-4}) = -b^{-8} = -\frac{1}{b^8}$

$3x \cdot 3x = 6x^2$	$2b^3 \cdot 3b^2 = 6b^5$
$-2x \cdot x^{-3} = -2x^{-2} = -\frac{2}{x^2}$	$2b^{-2} \cdot 3b^{-3} = 6b^{-5} = \frac{6}{b^5}$
$x^3 \cdot (-2x) = -2x^4$	$-2b^3 \cdot (-3b^2) = 6b^5$
$-3x \cdot (-2x) = 6x^2$	$2b^{-3} \cdot (-3b^4) = -6b^{-2} = -\frac{6}{b^2}$

2

$$(5a^3b^{-4})^{-2} = 5^{-2} a^{-6} b^8$$

$$= \frac{b^8}{25a^6}$$

$$-3a^5 \cdot a^{-2} = -3a^3$$

$$(-5a^{-2})^{-3} = -5^{-3} a^6$$

$$= -\frac{a^6}{125}$$

$$\left(\frac{a^3}{b^4}\right)^{-3} = \frac{b^{12}}{a^9}$$

$$\frac{3ab^5}{b^{-4}} = 3ab^9$$

$$a^4b^{-5} \cdot a^{-6}b^3 = a^{-2}b^{-2} = \frac{1}{ab^2}$$

$$(-2a^{-2})^{-3} = -2^{-3} a^6 = -\frac{a^6}{8}$$

$$(-2a^3)^{-2} = 2^{-2} a^{-6} = \frac{1}{4a^6}$$

$$\left(\frac{a}{b^{-1}}\right)^{-4} = \frac{a^{-4}}{b^4} = \frac{1}{a^4b^4}$$

$$\frac{3ab^{-4}}{2a^2b^{-2}c^5} = \frac{3b^2}{2ac}$$

$$(a^4b^{-3})^{-2} = a^{-8} b^6 = \frac{b^6}{a^8}$$

$$(a^{-2}b^4)^{-2} = a^4 b^{-8} = \frac{a^4}{b^8}$$

$$(a^3b^{-3})^{-2} = a^{-6} b^6 = \frac{b^6}{a^6}$$

$$\frac{5a^{-2}b^{-3}c^5}{2a^{-2}b^4c^2} = \frac{5ac^3}{2b^7}$$

$$\frac{2abc^3}{-3a^{-2}b^4c} = -\frac{2a^3c^2}{3b^4}$$

$$(-a^3b^{-2})^{-2} = \frac{-b^4}{a^6}$$

$$(2ab)^{-5} \cdot (3a)^{-3} = \frac{1}{2^5 a^5 b^5} \cdot \frac{1}{3^3 a^3} = \frac{1}{2^5 \cdot 3^3 a^8 b^5} = \frac{1}{2025 a^8 b^5}$$

$$(-5a)^2 \cdot (3a)^{-2} = \frac{25a^2}{9a^2} = \frac{25}{9}$$

$$\left(\frac{a}{b^{-1}}\right)^{-3} \cdot \left(\frac{b}{a^{-2}}\right)^{-2} = \frac{a^{-3}}{b^3} \cdot \frac{b^{-2}}{a^2} = \frac{1}{b^3 \cdot b \cdot a^2 \cdot a^3} = \frac{1}{b^4 a^5}$$

$$\left(\frac{a}{b}\right)^{-2} \cdot \left(\frac{b}{a}\right)^2 = \frac{b^2}{a^2} \cdot \frac{a^2}{b^2} = \frac{b^2}{a^2} \cdot \frac{a^2}{b^2} = 1$$