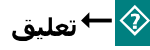
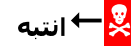


تمرين 1			
لنشر و نبسط :			
$(-10)^{-2} = \frac{1}{(-10)^2}$ $= \frac{1}{(-10) \times (-10)}$ $= \frac{1}{100}$	$\left(\frac{-5}{2}\right)^{-3} = \left(\frac{2}{-5}\right)^3 = \frac{2}{-125}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$	$4^{-1} = \frac{1}{4}$ $(x \neq 0) \quad x^{-1} = \frac{1}{x}$	$(-2)^3 = (-2) \times (-2) \times (-2)$ $= -8$
$(x \neq 0) \quad x^{-n} = \frac{1}{x^n}$	$(-1)^{2000} + (-1)^{2001} = 1 + (-1)$ $= 0$	$(-1)^{2007} = -1$	$(-2007)^0 = 1$ $(x \neq 0) \quad x^0 = 0$

تمرين 2													
لنشر و نبسط :													
$K = \left(\frac{3}{4}\right)^{-7} \times \left(\frac{4}{3}\right)^{-10}$ $= \left(\frac{4}{3}\right)^7 \times \left(\frac{4}{3}\right)^{-10}$ $= \left(\frac{4}{3}\right)^{-3}$	$2^7 \times 10^{-17} \times 5^7 = 2^7 \times 5^7 \times 10^{-17}$ $= 10^7 \times 10^{-17}$ $= 10^{-10}$ $a^n \times b^n = (ab)^n$ $a^n \times a^m = a^{n+m}$	$(a^4)^{-2} \times (a^{-3})^{-7} = a^{-8} \times a^{21}$ $= a^{13}$	$a^5 \times a^{13} \times a^{-7} = a^{5+13+(-7)}$ $= a^{11}$										
<p>⚠ : لاتخلط بين قواعد جمع و ضرب الأعداد النسبية.</p> <p>تذكير :</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">أمثلة الضرب :</th> <th style="width: 50%; text-align: center;">أمثلة الجمع :</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">$13 \times 2 = +26$</td> <td style="text-align: center;">$13 + 2 = +15$</td> </tr> <tr> <td style="text-align: center;">$(-13) \times (-2) = +26$</td> <td style="text-align: center;">$(-13) + (-2) = -15$</td> </tr> <tr> <td style="text-align: center;">$(-13) \times 2 = -26$</td> <td style="text-align: center;">$(-13) + 2 = -11$</td> </tr> <tr> <td style="text-align: center;">$13 \times (-2) = -26$</td> <td style="text-align: center;">$13 + (-2) = +11$</td> </tr> </tbody> </table>				أمثلة الضرب :	أمثلة الجمع :	$13 \times 2 = +26$	$13 + 2 = +15$	$(-13) \times (-2) = +26$	$(-13) + (-2) = -15$	$(-13) \times 2 = -26$	$(-13) + 2 = -11$	$13 \times (-2) = -26$	$13 + (-2) = +11$
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$\frac{a^4 b^{-2} a b^{-3}}{a^{-3} b^2 a^5 b} = \frac{a^4 \times a^1 \times b^{-2} \times b^{-3}}{a^{-3} \times a^5 \times b^2 \times b} = \frac{a^5 \times b^{-5}}{a^2 \times b^3} = a^{5-2} \times b^{-5-3} = a^3 b^{-8}$													
$\left(a^{-3} \times b^2 \times c^{-5}\right)^3 \left((a^4)^{-2} \times b^{-3}\right)^{-3} = (a^3)^3 \times (b^2)^3 \times (c^{-5})^3 \times (a^{-8} \times b^{-3})^{-3}$ $= a^{-9} \times b^6 \times c^{-15} \times (a^{-8})^{-3} \times (b^{-3})^{-3}$ $= a^{-9} \times b^6 \times c^{-15} \times a^{24} \times b^9$ $= a^{15} \times b^{15} \times c^{-15}$ $= \left(\frac{ab}{c}\right)^{15}$													



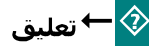
تعليق



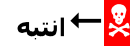
انتبه

تمرين 3

لنحسب K حيث $a = 0,01$ و $b = 1000$: لدينا : $a = 10^{-2}$ و $b = 10^3$ إذن :	لنيسط :
$K = (10^{-2})^{-9} \times (10^3)^7$ $K = 10^{18} \times 10^{21}$ $K = 10^{39}$	$K = \frac{ab^{-2} (a^{-1} b^2)^3 a^{-2} b^3}{a^{-2} (a^2 b^{-1})^2 (a^3 b^2)}$ $K = \frac{a \times b^{-2} \times (a^{-1})^3 \times (b^2)^3 \times a^{-2} \times b^3}{a^{-2} \times (a^2)^2 \times (b^{-1})^2 \times a^3 \times b^2}$ $K = \frac{a \times b^{-2} \times a^{-3} \times b^6 \times a^{-2} \times b^3}{a^{-2} \times a^4 \times b^{-2} \times a^3 \times b^2}$ $K = \frac{a^{1+(-3)+(-2)} \times b^{-2+6+3}}{a^{-2+4+3} \times b^{-2+2}}$ $K = \frac{a^{-4} \times b^7}{a^5 \times b^0}$ $K = \frac{a^{-4-5} \times b^7}{1}$ $K = a^{-9} b^7$



تعليق



انتبه

تمرين 4

لنبين أن : $1 + 2^2 + 2^3 + 2^4 + \dots + 2^9 + 2^{10} = 2^{11} - 1$	
$2 \times a = 2 \times (1 + 2^2 + 2^3 + 2^4 + \dots + 2^9 + 2^{10})$ $2a = 2 + 2^3 + 2^4 + \dots + 2^{10} + 2^{11}$ $2a = 1 + 2 + 2^3 + 2^4 + \dots + 2^{10} + 2^{11} - 1$ $2a = a + 2^{11} - 1$	<p>نضع : $a = 1 + 2^2 + 2^3 + 2^4 + \dots + 2^9 + 2^{10}$ منه</p> <p>منه $2a - a = 2^{11} - 1$ بالتالي : $a = 2^{11} - 1$</p>