

الجذور المربعة

تمرين 1

احسب ما يلي : $D = \sqrt{31 + \sqrt{21 + \sqrt{9 + \sqrt{49}}}}$ ، $C = \sqrt{\frac{50}{98}}$ ، $B = \frac{\sqrt{9 + \sqrt{121}}}{\sqrt{49}}$ ، $A = \sqrt{1000000}$

تمرين 2

بسّط ما يلي : $D = \sqrt{24} + 7\sqrt{6} + 2\sqrt{54}$ ، $C = 5\sqrt{27}$ ، $B = \sqrt{363}$ ، $A = \sqrt{50}$
 $H = \sqrt{7} \left(\sqrt{700} + (\sqrt{7})^3 \right)$ ، $G = \sqrt{242} \times \sqrt{128}$ ، $F = \sqrt{5^3 \times 7^5 \times 1000}$ ، $E = \sqrt{3} \times \sqrt{21} \times \sqrt{7}$
 $L = (\sqrt{3} + 5)(2\sqrt{3} + 1)(1 + \sqrt{3})$ ، $K = (\sqrt{3} - 1)^4$ ، $J = (\sqrt{5} + 2)^2$ ، $I = (\sqrt{13} - 5)(\sqrt{13} + 5)$

تمرين 3

بسّط ما يلي : $D = \sqrt{8 - 2\sqrt{12}}$ ، $C = \sqrt{3 + 2\sqrt{2}}$ ، $B = \sqrt{(\sqrt{5} - 1)^2} + \sqrt{(\sqrt{5} - 7)^2}$ ، $A = \sqrt{(\sqrt{7} - 3)^2}$

تمرين 4

اجعل مقام الأعداد التالية عددا صحيحا : $D = \frac{3 + \sqrt{5}}{7 + \sqrt{5}} - \frac{3 - \sqrt{5}}{7 - \sqrt{5}}$ ، $C = \frac{5}{\sqrt{7} - 2} - \frac{2}{\sqrt{7}}$ ، $B = \frac{\sqrt{5} - 3}{\sqrt{5}}$ ، $A = \frac{3}{\sqrt{2} - 1}$

الجذور المربعة - حلول

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تمارين 1			
لنحسب :			
$D = \sqrt{31 + \sqrt{21 + \sqrt{9 + \sqrt{49}}}}$ $D = \sqrt{31 + \sqrt{21 + \sqrt{9 + 7}}}$ $D = \sqrt{31 + \sqrt{21 + \sqrt{16}}}$ $D = \sqrt{31 + \sqrt{21 + 4}}$ $D = \sqrt{31 + \sqrt{25}}$ $D = \sqrt{31 + 5}$ $D = \sqrt{36} = 6$	$C = \sqrt{\frac{50}{98}}$ $C = \sqrt{\frac{25}{49}}$ $C = \frac{5}{7}$	$B = \frac{\sqrt{9} + \sqrt{121}}{\sqrt{49}}$ $B = \frac{3 + 11}{7}$ $B = \frac{14}{7}$ $B = 2$	$A = \sqrt{1000000}$ $A = \sqrt{10^6}$ $A = \sqrt{(10^3)^2}$ $A = 10^3$
نختزل أولاً :			
نبدأ بتبسيط الأقواس الداخلية :			

تمارين 2			
لنحسب :			
$D = \sqrt{24} + 7\sqrt{6} + 2\sqrt{54}$ $D = \sqrt{4 \times 6} + 7\sqrt{6} + 2\sqrt{9 \times 6}$ $D = 2\sqrt{6} + 7\sqrt{6} + 2 \times 3\sqrt{6}$ $D = 2\sqrt{6} + 7\sqrt{6} + 6\sqrt{6}$ $D = (2 + 7 + 6)\sqrt{6}$ $D = 15\sqrt{6}$	$C = 5\sqrt{27} = 5 \times \sqrt{9 \times 3}$ $C = 5 \times 3\sqrt{3} = 15\sqrt{3}$	$B = \sqrt{363} = \sqrt{121 \times 3} = 11\sqrt{3}$	$A = \sqrt{50} = \sqrt{25 \times 2} = 5\sqrt{2}$
$K = (\sqrt{3} - 1)^4$ $K = \left((\sqrt{3} - 1)^2 \right)^2$ $K = \left((\sqrt{3})^2 - 2 \times \sqrt{3} \times 1 + 1^2 \right)^2$ $K = (3 - 2\sqrt{3} + 1)^2$ $K = (4 - 2\sqrt{3})^2$ $K = 4^2 - 2 \times 4 \times 2\sqrt{3} + (2\sqrt{3})^2$ $K = 16 - 16\sqrt{3} + 4 \times 3$ $K = 16 - 16\sqrt{3} + 12$ $K = 28 - 16\sqrt{3}$	$G = \sqrt{242} \times \sqrt{128}$ $G = \sqrt{121 \times 2} \times \sqrt{64 \times 2}$ $G = 11\sqrt{2} \times 8\sqrt{2}$ $G = 88 \times (\sqrt{2})^2$ $G = 88 \times 2$ $G = 176$	$F = \sqrt{5^3 \times 7^5 \times 1000}$ $F = \sqrt{5^2 \times 5 \times 7^4 \times 7 \times 100 \times 10}$ $F = 5 \times 7^2 \times 10 \sqrt{5 \times 7 \times 10}$ $F = 5 \times 49 \times 10 \sqrt{5 \times 7 \times 5 \times 2}$ $F = 5 \times 490 \times 5\sqrt{7 \times 2}$ $F = 12250\sqrt{14}$	$E = \sqrt{3} \times \sqrt{21} \times \sqrt{7}$ $E = \sqrt{3 \times 7} \times \sqrt{21}$ $E = \sqrt{21} \times \sqrt{21}$ $E = (\sqrt{21})^2$ $E = 21$
$I = (\sqrt{13} - 5)(\sqrt{13} + 5)$ $I = (\sqrt{13})^2 - 5^2$ $I = 13 - 25$ $I = -12$	$J = (\sqrt{5} + 2)^2$ $J = (\sqrt{5})^2 + 2 \times \sqrt{5} \times 2 + 2^2$ $J = 5 + 4\sqrt{5} + 4$ $J = 9 + 4\sqrt{5}$	$L = (\sqrt{3} + 5)(2\sqrt{3} + 1)(1 + \sqrt{3})$ $L = (6 + \sqrt{3} + 10\sqrt{3} + 5)(1 + \sqrt{3})$ $L = (11 + 11\sqrt{3})(1 + \sqrt{3})$ $L = 11 + 11\sqrt{3} + 11\sqrt{3} + 33$ $L = 44 + 22\sqrt{3}$	$H = \sqrt{7} \left(\sqrt{700} + (\sqrt{7})^3 \right)$ $H = \sqrt{7} \left(\sqrt{100 \times 7} + (\sqrt{7})^2 \sqrt{7} \right)$ $H = \sqrt{7} (10\sqrt{7} + 7\sqrt{7})$ $H = \sqrt{7} (17\sqrt{7})$ $H = 17 \times 7$ $H = 119$
بسطنا مباشرة أثناء النشر :			

لنسط :

$B = \sqrt{(\sqrt{5}-1)^2} + \sqrt{(\sqrt{5}-7)^2}$ $B = \sqrt{5}-1 + \sqrt{5}-7 $ $B = \sqrt{5}-1+7-\sqrt{5}$ $B = 6$	<p>لدينا $\sqrt{5} > 1$ منه $\sqrt{5}-1 > 0$</p> <p>لدينا $\sqrt{5} < 7$ منه $\sqrt{5}-7 < 0$</p> <p>بالتالي :</p>	$A = \sqrt{(\sqrt{7}-3)^2} = \sqrt{7}-3 $ <p>ولدينا $(\sqrt{7})^2 = 7$ و $3^2 = 9$ و $7 < 9$</p> <p>منه $\sqrt{7} < 3$ منه $\sqrt{7}-3 < 0$</p> <p>بالتالي $A = -(\sqrt{7}-3) = 3-\sqrt{7}$</p>
<p>لأن $\sqrt{2} + \sqrt{6} > 0$</p> $D = \sqrt{8-2\sqrt{12}} = \sqrt{2+2\sqrt{2} \times \sqrt{6} + 6}$ $D = \sqrt{(\sqrt{2})^2 + 2\sqrt{2} \times \sqrt{6} + (\sqrt{6})^2}$ $D = \sqrt{(\sqrt{2} + \sqrt{6})^2}$ $D = \sqrt{2} + \sqrt{6} $ $D = \sqrt{2} + \sqrt{6}$	$C = \sqrt{3+2\sqrt{2}} = \sqrt{1+2\sqrt{2} + 2}$ $C = \sqrt{1^2 + 2 \times 1 \times \sqrt{2} + (\sqrt{2})^2}$ <p>لأن $1 + \sqrt{2} > 0$</p> $C = \sqrt{(1 + \sqrt{2})^2}$ $C = 1 + \sqrt{2} $ $C = 1 + \sqrt{2}$	

لتبسيط العددين C و D يجب كتابة مداخل الجذر مربع على شكل المتطابقة هامة $(a+b)^2$ أو $(a-b)^2$

$B = \frac{\sqrt{5}-3}{\sqrt{5}} = \frac{(\sqrt{5}-3) \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{5-3\sqrt{5}}{5}$	$A = \frac{3}{\sqrt{2}-1} = \frac{3 \times (\sqrt{2}+1)}{(\sqrt{2}-1) \times (\sqrt{2}+1)} = \frac{3\sqrt{2}+3}{(\sqrt{2})^2-1^2} = \frac{3\sqrt{2}+3}{2-1} = 3\sqrt{2}+3$
$C = \frac{5}{\sqrt{7}-2} - \frac{2}{\sqrt{7}} = \frac{5(\sqrt{7}+2)}{(\sqrt{7}-2)(\sqrt{7}+2)} - \frac{2\sqrt{7}}{(\sqrt{7})^2} = \frac{5\sqrt{7}+10}{7-4} - \frac{2\sqrt{7}}{7} = \frac{5\sqrt{7}+10}{3} - \frac{2\sqrt{7}}{7} = \frac{7(5\sqrt{7}+10)}{21} - \frac{3(2\sqrt{7})}{21} = \frac{35\sqrt{7}+70-6\sqrt{7}}{21} = \frac{29\sqrt{7}+70}{21}$	
$D = \frac{3+\sqrt{5}}{7+\sqrt{5}} - \frac{3-\sqrt{5}}{7-\sqrt{5}} = \frac{(3+\sqrt{5})(7-\sqrt{5})}{(7+\sqrt{5})(7-\sqrt{5})} - \frac{(3-\sqrt{5})(7+\sqrt{5})}{(7-\sqrt{5})(7+\sqrt{5})} = \frac{21-3\sqrt{5}+7\sqrt{5}-5}{49-5} - \frac{21+3\sqrt{5}-7\sqrt{5}-5}{49-5}$	
$D = \frac{21-3\sqrt{5}+7\sqrt{5}-5-21-3\sqrt{5}+7\sqrt{5}+5}{44} = \frac{(-3-3+7+7)\sqrt{7}}{44} = \frac{8\sqrt{7}}{44} = \frac{2\sqrt{7}}{11}$	