

الجذور المربعة - حلول

R

تمرين 1

انتبه
تعليق

لنحسب :

$D = \sqrt{31 + \sqrt{21 + \sqrt{9 + \sqrt{49}}}}$ $D = \sqrt{31 + \sqrt{21 + \sqrt{9 + 7}}}$ $D = \sqrt{31 + \sqrt{21 + \sqrt{16}}}$ $D = \sqrt{31 + \sqrt{21 + 4}}$ $D = \sqrt{31 + \sqrt{25}}$ $D = \sqrt{31 + 5}$ $D = \sqrt{36} = 6$ <p style="margin-top: 10px;">نبدأ بتبسيط الأقواس الداخلية</p>	$C = \sqrt{\frac{50}{98}}$ $C = \sqrt{\frac{25}{49}}$ $C = \frac{5}{7}$ <p style="margin-top: 10px;">نختزل أولا</p>	$B = \frac{\sqrt{9} + \sqrt{121}}{\sqrt{49}}$ $B = \frac{3 + 11}{7}$ $B = \frac{14}{7}$ $B = 2$	$A = \sqrt{1000000}$ $A = \sqrt{10^6}$ $A = \sqrt{(10^3)^2}$ $A = 10^3$
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تمرين 2

انتبه
تعليق

لنحسب :

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

بسطنا مباشرة أثناء النشر

تعليق

انتبه

تمرين 3

لنسط :

$$B = \sqrt{(\sqrt{5}-1)^2} + \sqrt{(\sqrt{5}-7)^2}$$

لدينا $\sqrt{5} > 1$ منه $\sqrt{5}-1 > 0$

$$B = |\sqrt{5}-1| + |\sqrt{5}-7|$$

لدينا $\sqrt{5} < 7$ منه $\sqrt{5}-7 < 0$

$$B = \sqrt{5}-1+7-\sqrt{5}$$

$$B = 6$$

بالتالي :

$$A = \sqrt{(\sqrt{7}-3)^2} = |\sqrt{7}-3|$$

ولدينا $(\sqrt{7})^2 = 7$ و $3^2 = 9$ و $7 < 9$

منه $\sqrt{7} < 3$ منه $\sqrt{7}-3 < 0$

بالتالي $A = -(\sqrt{7}-3) = 3-\sqrt{7}$

لأن $\sqrt{2} + \sqrt{6} > 0$

$$D = \sqrt{8-2\sqrt{12}} = \sqrt{2+2\sqrt{2}\times\sqrt{6}+6}$$

$$D = \sqrt{(\sqrt{2})^2 + 2\sqrt{2}\times\sqrt{6} + (\sqrt{6})^2}$$

$$D = \sqrt{(\sqrt{2} + \sqrt{6})^2}$$

$$D = |\sqrt{2} + \sqrt{6}|$$

$$D = \sqrt{2} + \sqrt{6}$$

$$C = \sqrt{3+2\sqrt{2}} = \sqrt{1+2\sqrt{2}+2}$$

$$C = \sqrt{1^2 + 2\times 1\times\sqrt{2} + (\sqrt{2})^2}$$

لأن $1+\sqrt{2} > 0$

$$C = \sqrt{(1+\sqrt{2})^2}$$

$$C = |1+\sqrt{2}|$$

$$C = 1+\sqrt{2}$$

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

تعليق

انتبه

تمرين 4

$$B = \frac{\sqrt{5}-3}{\sqrt{5}} = \frac{(\sqrt{5}-3)\times\sqrt{5}}{\sqrt{5}\times\sqrt{5}} = \frac{5-3\sqrt{5}}{5}$$

$$A = \frac{3}{\sqrt{2}-1} = \frac{3\times(\sqrt{2}+1)}{(\sqrt{2}-1)\times(\sqrt{2}+1)} = \frac{3\sqrt{2}+3}{(\sqrt{2})^2-1^2} = \frac{3\sqrt{2}+3}{2-1} = 3\sqrt{2}+3$$

$$C = \frac{5}{\sqrt{7}-2} - \frac{2}{\sqrt{7}} = \frac{5(\sqrt{7}+2)}{(\sqrt{7}-2)(\sqrt{7}+2)} - \frac{2\sqrt{7}}{(\sqrt{7})^2} = \frac{5\sqrt{7}+10}{7-4} - \frac{2\sqrt{7}}{7} = \frac{5\sqrt{7}+10}{3} - \frac{2\sqrt{7}}{7} = \frac{7(5\sqrt{7}+10)}{21} - \frac{3(2\sqrt{7})}{21} = \frac{35\sqrt{7}+70-6\sqrt{7}}{21} = \frac{29\sqrt{7}+70}{21}$$

$$D = \frac{3+\sqrt{5}}{7+\sqrt{5}} - \frac{3-\sqrt{5}}{7-\sqrt{5}} = \frac{(3+\sqrt{5})(7-\sqrt{5})}{(7+\sqrt{5})(7-\sqrt{5})} - \frac{(3-\sqrt{5})(7+\sqrt{5})}{(7-\sqrt{5})(7+\sqrt{5})} = \frac{21-3\sqrt{5}+7\sqrt{5}-5}{49-5} - \frac{21+3\sqrt{5}-7\sqrt{5}-5}{49-5}$$

$$D = \frac{21-3\sqrt{5}+7\sqrt{5}-5-21-3\sqrt{5}+7\sqrt{5}+5}{44} = \frac{(-3-3+7+7)\sqrt{7}}{44} = \frac{8\sqrt{7}}{44} = \frac{2\sqrt{7}}{11}$$