

الجذور المربعة

تمرين 1: أتم ما يلي:

$$D = \sqrt{20} - 4\sqrt{45} = \sqrt{\dots} \times \sqrt{\dots} - 4\sqrt{\dots} \times \sqrt{\dots}$$

$$= \dots\sqrt{\dots} - 4 \times \dots \times \sqrt{\dots}$$

$$= \dots\sqrt{\dots} - \dots\sqrt{\dots} = (\dots - \dots)\sqrt{\dots} = \dots\sqrt{\dots}$$

$$K = 2\sqrt{27} - \sqrt{12} - 4\sqrt{3}$$

$$E = 7\sqrt{18} - 2\sqrt{32}$$

تمرين 5: أحسب و بسط:

تذكر!: $\sqrt{a \pm b} \neq \sqrt{a} \pm \sqrt{b}$

| | | | |
|-------------------------|------------------------------|------------------------------|----------------------------|
| $\sqrt{16+9}$ | $\sqrt{16} + \sqrt{9}$ | $\sqrt{10^2 - 6^2}$ | $\sqrt{10^2} - \sqrt{6^2}$ |
| $\sqrt{29 + \sqrt{49}}$ | $\sqrt{3^2 + 4^2 + 5^2 - 1}$ | $\sqrt{6^2 - \sqrt{9} + 16}$ | |

تمرين 6: إجعل المقام عددا جذريا كما في المثالين:

$$\frac{\sqrt{3}}{7 + \sqrt{5}} = \frac{\sqrt{3}(\dots)}{(7 + \sqrt{5})(\dots)}$$

$$= \frac{\sqrt{3}(\dots)}{\dots - \dots}$$

$$= \frac{\sqrt{3}(\dots)}{\dots} = \frac{\sqrt{3}(\dots)}{\dots}$$

| | |
|--|---------------------------------|
| $\frac{1 + \sqrt{2}}{\sqrt{3} + \sqrt{7}}$ | $\frac{2}{\sqrt{8} - \sqrt{6}}$ |
|--|---------------------------------|

مثال 1 ضرب البسط و المقام في مرافق المقام:

$$\frac{\sqrt{5}}{3 - \sqrt{2}} = \frac{\sqrt{5}(3 + \sqrt{2})}{(3 - \sqrt{2})(3 + \sqrt{2})}$$

$$= \frac{\sqrt{5}(3 + \sqrt{2})}{3^2 - \sqrt{2}^2}$$

$$= \frac{\sqrt{5}(3 + \sqrt{2})}{9 - 2} = \frac{\sqrt{5}(3 + \sqrt{2})}{7}$$

مثال 2

$$\frac{\sqrt{5}}{7\sqrt{3}} = \frac{\sqrt{5} \times \sqrt{3}}{7\sqrt{3} \times \sqrt{3}}$$

$$= \frac{\sqrt{15}}{7 \times 3} = \frac{\sqrt{15}}{21}$$

تمرين 7: أشر و بسط:

$$(2\sqrt{12} + \sqrt{3})^2 \quad ; \quad \sqrt{6} \left(\sqrt{\frac{3}{2}} - \sqrt{\frac{2}{3}} \right) \quad ; \quad \sqrt{8}(\sqrt{8} + \sqrt{2})$$

$$\sqrt{\sqrt{5} - 1} \times \sqrt{\sqrt{5} + 1} \quad ; \quad (\sqrt{11} + 3)(\sqrt{11} - 3) \quad ; \quad (\sqrt{18} - \sqrt{8})^2$$

ب - عمل: $x^2 - 5$; $x^2 + 2\sqrt{7}x + 7$; $x^2 + 2\sqrt{15}x + 5$

تمرين 8: بسط ما يلي:

$$\sqrt{3}^0 - 5^{-5} \times \sqrt{5^2} \quad ; \quad \sqrt{5 \times 15^3 \times 3} \quad ; \quad \sqrt{7 + \sqrt{3 + \sqrt{1}}}$$

$$\sqrt{\frac{18}{5}}^3 \times \sqrt{\frac{5}{2}}^3 \quad ; \quad \frac{\sqrt{17}^{11}}{\sqrt{17}^{13}} \quad ; \quad \sqrt{3^7} \times \sqrt{3^{-5}}$$

$$\frac{(\sqrt{700})^{-3}}{(\sqrt{7})^{-3}} \quad ; \quad \sqrt{5^{-4}}^2$$

$$(2 - \sqrt{2})^{-1} + (2 + \sqrt{2})^{-1}$$

| | | | |
|--------------------------------|------------------------------|--|---|
| $\sqrt{25} = \dots$ | $\sqrt{36} = \dots$ | $\sqrt{64} = \dots$ | $\sqrt{\dots} = 4$ |
| $\sqrt{81} = \dots$ | $\sqrt{11^2} = \dots$ | $\sqrt{(-18)^2} = \dots$ | $\sqrt{7^2} = \dots$ |
| $\sqrt{\dots} = 13$ | $\sqrt{\frac{4}{9}} = \dots$ | $\sqrt{\left(\frac{8}{12}\right)^2} = \dots$ | $\sqrt{\frac{\dots}{\dots}} = \frac{1}{10}$ |
| $\sqrt{\frac{49}{36}} = \dots$ | $\sqrt{3^4} = \dots$ | $\sqrt{0,49} = \dots$ | $\sqrt{7^6} = \dots$ |

تذكر!: $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$ و $\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$

تمرين 2: أ-- لاحظ المثال و أتم بنفس الطريقة:

مثال $\sqrt{3} \times \sqrt{12} = \sqrt{3 \times 12} = \sqrt{36} = 6$

$$\sqrt{50} \times \sqrt{2} = \dots = \dots = \dots$$

$$5\sqrt{2} \times 4\sqrt{6} \times \sqrt{3} = \dots = \dots = \dots$$

ب--

$$\sqrt{49 \times 64} = \sqrt{\dots \times \dots} = \dots \times \dots = \dots$$

$$\sqrt{4 \times 25 \times 81} = \dots \times \dots \times \dots = \dots = \dots$$

$$\sqrt{7^2 \times 9 \times 8^2} = \dots \times \dots \times \dots = \dots = \dots$$

ت-- تبسيط الجذر المربع: أكتب على شكل $a\sqrt{b}$ كما في المثال:

مثال: $\sqrt{75} = \sqrt{25 \times 3} = 5\sqrt{3}$

$$\sqrt{28} = \sqrt{\dots \times 7} = \dots\sqrt{7} \quad ; \quad \sqrt{99} = \sqrt{\dots \times \dots} = \dots\sqrt{\dots}$$

$$\sqrt{98} = \sqrt{\dots \times \dots} = \dots\sqrt{\dots}$$

تمرين 3: أ-- أتم ما يلي كما في المثال:

مثال $\frac{\sqrt{360}}{\sqrt{10}} = \sqrt{\frac{360}{10}} = \sqrt{36} = 6$

| | |
|--|--|
| $\frac{\sqrt{84}}{\sqrt{6}} = \sqrt{\frac{\dots}{\dots}} = \sqrt{\dots} = \dots$ | $\frac{\sqrt{28}}{\sqrt{7}} = \sqrt{\frac{\dots}{\dots}} = \sqrt{\dots} = \dots$ |
|--|--|

ب-- أتم:

| | |
|---|--|
| $\frac{\sqrt{36}}{\sqrt{25}} = \frac{\sqrt{36}}{\sqrt{25}} = \dots$ | $\frac{\sqrt{900}}{\sqrt{16}} = \frac{\sqrt{\dots}}{\sqrt{\dots}} = \dots$ |
|---|--|

تمرين 4: بسط التعبيرات التالية:

$$A = 7\sqrt{5} - 4\sqrt{5} + \sqrt{5} = (\dots - \dots + \dots)\sqrt{5} = \dots\sqrt{5}$$

$$B = 3\sqrt{2} + 5\sqrt{2} - 2\sqrt{2} = (\dots + \dots - \dots)\sqrt{2} = \dots\sqrt{2}$$

$$C = 11\sqrt{2} - 3\sqrt{18} + \sqrt{8}$$

$$= 11\sqrt{2} - 3\sqrt{\dots \times 2} + \sqrt{\dots \times 2}$$

$$= 11\sqrt{2} - 3 \times \dots \times \sqrt{2} + \dots \times \sqrt{2}$$

$$= 11\sqrt{2} - \dots\sqrt{2} + \dots\sqrt{2} = (11 - \dots + \dots)\sqrt{2} = \dots\sqrt{2}$$