Problemas

9.14)

(a) $\sqrt{4} \cdot \sqrt{25} = \sqrt{\quad}$

$2 \cdot 5 = 10 = \sqrt{100}$ Notar que $\sqrt{4} \cdot \sqrt{25} = \sqrt{4 \cdot 25}$

(b) $\left(\sqrt{2} \cdot \sqrt{3}\right)^2 = 2 \cdot 3 = 6$

(c) $\sqrt{2} \cdot \sqrt{3} = \sqrt{\quad}$

$\sqrt{2} \cdot \sqrt{3} = \sqrt{2 \cdot 3} = \sqrt{6}$

(d) $\sqrt{a} \cdot \sqrt{b}$.

$\left(\sqrt{a} \cdot \sqrt{b}\right)^2 = a \cdot b$ $\left(\sqrt{ab}\right)^2 = a \cdot b$

Ya que el cuadrado de $\sqrt{a} \cdot \sqrt{b}$ es ab, tenemos que $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$.

Importante: Si a y b son no-negativos, entonces

$$\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$$

9.15)

(a) $\sqrt{2} \cdot \sqrt{8} = \sqrt{2 \cdot 8} = \sqrt{16} = 4$

(b) $\sqrt{18} \cdot \sqrt{50} = \sqrt{18 \cdot 50} = \sqrt{3 \cdot 3 \cdot 5 \cdot 5 \cdot 2}$

$= \sqrt{3^2 \cdot 2^2 \cdot 5^2} = 3 \cdot 2 \cdot 5 = 30$

(c) $\sqrt{24} \cdot \sqrt{10} \cdot \sqrt{15} = \sqrt{4 \cdot 3 \cdot 2 \cdot 5 \cdot 2 \cdot 5 \cdot 3} = \sqrt{3^2 \cdot 5^2 \cdot 4^2}$

$= 3 \cdot 5 \cdot 4 = 60$

(d) $(5\sqrt{3}) \cdot 3\sqrt{27} = 15 \cdot \sqrt{3^4} = 15 \cdot 9 = 135$

9.16)

(a) $\sqrt{\frac{49}{4}} = \sqrt{49 \cdot \frac{1}{4}} = 7 \cdot \frac{1}{2} = \frac{7}{2}$

(b) $\sqrt{\frac{54}{384}}$ $\qquad \frac{54}{384} = \frac{18}{128} = \frac{9}{64}$

$\sqrt{\frac{9}{64}} = 3 \cdot \frac{1}{8} = \frac{3}{8}$

(c) $\sqrt{11\frac{1}{9}}$ $\qquad 11\frac{1}{9} = \frac{99}{9} + \frac{1}{9} = \frac{100}{9}$

$\sqrt{\frac{100}{9}} = 10 \cdot \frac{1}{3} = \frac{10}{3} = 3\frac{1}{3}$

(d) $\frac{\sqrt{54}}{\sqrt{6}} = \sqrt{\frac{54}{6}} = 3$

(e) $\frac{\sqrt{63}}{\sqrt{28}} = \sqrt{\frac{63}{28}}$ $\qquad \frac{63}{28} = \frac{9}{4}$

$= \sqrt{\frac{9}{4}} = 3 \cdot \frac{1}{2} = \frac{3}{2}$

Importante: Si a es no-negativo y b es positivo, entonces:

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

9.17)

(a) $\sqrt{0.64} = \sqrt{64 \cdot 10^{-2}} = \sqrt{64 \cdot \frac{1}{100}} = 8 \cdot \frac{1}{10} = \frac{4}{5} = 0.8$

(b) $\sqrt{2.25} = \sqrt{\frac{9}{4}} = \frac{3}{2} = 1.5$

(c) $\sqrt{0.000169} = \sqrt{169 \cdot 10^{-6}} = \sqrt{\frac{169}{(10^3)^2}} = \frac{13}{10^3} = 0.013$

(d) $\sqrt{14.4}$

$\sqrt{14.4}$ se encuentra entre 3 y 4.

$3.5^2 = 12.25$, es decir que se encuentra entre 3.5 y 4, por lo que el entero más cercano es 4.

9.18)

$\sqrt{4} + \sqrt{9} = \sqrt{13}$

$2 + 3 = 5$. No

9.19)

$\sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$

$13 \neq 5 + 12$.

9.20)

(a) $(\sqrt{12})^2 = 12$, $(2\sqrt{3})^2 = 4 \cdot 3 = 12$

(b) $\sqrt{18} = \sqrt{9 \cdot 2} = 3\sqrt{2}$

(c) $\sqrt{432} = \sqrt{16 \cdot 9 \cdot 3} = 4 \cdot 3\sqrt{3} = 12\sqrt{3}$

(d) $\sqrt{1176} = \sqrt{4 \cdot 6 \cdot 49} = 2 \cdot 7\sqrt{6} = 14\sqrt{6}$

9.21)

$\sqrt{25x^8} = 5 \cdot x^4 = 5x^4$

9.22)

$\sqrt{50} - \sqrt{18} - \sqrt{8}$

$\sqrt{25 \cdot 2} - \sqrt{9 \cdot 2} - \sqrt{4 \cdot 2}$

$5\sqrt{2} - 3\sqrt{2} - 2\sqrt{2} = 0$

Ejercicios.

9.3.1)

(a) 6 (c) 60 (e) 90 (g) $\frac{5}{12}$

(b) 20 (d) 30 (f) 10 (h) $2\frac{5}{6}$

(i) 0.009

9.3.2)

$$\sqrt{64\,t^{64}} = 8\,t^{32}$$

9.3.3)

$$\sqrt{250} = \sqrt{25 \cdot 10} = 5 \cdot 3.16 = 15.8$$

$$\begin{array}{r} {\scriptstyle 3} \\ 3.16 \\ \times \quad 5 \\ \hline 15.80 \end{array}$$

9.3.4)

$$\sqrt{\frac{5}{27}} \cdot \sqrt{\frac{5}{3}} = \sqrt{\frac{25}{81}} = \frac{5}{9}$$

9.3.5)

$$A = \sqrt{1.44} = \sqrt{144 \times 10^{-2}} = \frac{12}{10} = 1.2$$

$$B = \frac{13}{11} = 1\frac{2}{11} = 1 + 0.\overline{18} = 1.\overline{18}$$

$$C = \sqrt{8} - 2\sqrt{2} = 2\sqrt{2} - 2\sqrt{2} = 0$$

$$D = \frac{3}{5} + \frac{3}{4} = \frac{12+15}{20} = \frac{27}{20} = 1\frac{7}{20} = 1.35$$

$$C < B < A < D$$

9.3.6)

(a) $\sqrt{363} = 11\sqrt{3}$

(b) $\sqrt{525} = \sqrt{25 \cdot 21} = 5\sqrt{21}$

(c) $\sqrt{3168} = \sqrt{4 \cdot 792}$

$= \sqrt{4 \cdot 4 \cdot 88}$

$= \sqrt{4 \cdot 4 \cdot 4 \cdot 22} = 2 \cdot 3 \cdot 2\sqrt{22}$

$= 12\sqrt{22}$

9.3.7)

$3\sqrt{75} + 2\sqrt{27}$

$15\sqrt{3} + 6\sqrt{3} = 21\sqrt{3}$

9.3.8)

$$\sqrt{25 \cdot 3 \cdot x} \cdot \sqrt{2x} \cdot \sqrt{7 \cdot 2 \cdot x} = 5 \cdot 2 \sqrt{21x^2 \cdot x}$$

$$= 10x\sqrt{21x}$$

9.3.9)

$$\frac{\sqrt{375} + \sqrt{60}}{\sqrt{5}} = \frac{5\sqrt{15} + 2\sqrt{15}}{\sqrt{5}} = \frac{7\sqrt{5} \cdot \sqrt{3}}{\sqrt{5}} = 7\sqrt{3}$$