

Departamento de Matemáticas $1^{\underline{0}}$ Bachillerato



2 - Potencias y radicales

1. p4e1-2 - Calcula :

(a) $\frac{3^{-2} \cdot 3^5 \cdot 2^3}{(3 \cdot 2)^4}$

Sol: $\frac{1}{6}$

(b) $3^{-5} \cdot (\frac{1}{3})^{-2} \cdot 81$

Sol: 3

(c) $(\frac{5}{4})^5 \cdot \frac{2^6}{5^2}$

Sol: $\frac{125}{16}$

(d) $\frac{2^{-2} \cdot (2^2)^3}{2^{-3}}$

Sol: 128

(e) $\frac{5^{-3} \cdot 5^{-1} \cdot 5^2}{5^0 + 5^6}$

Sol: $\frac{1}{390650}$

(f) $(\frac{2}{3})^{-2} \cdot (\frac{3}{2})^4$

Sol: $\frac{729}{64}$

 $(g) \quad \frac{\sqrt{2} \cdot \left(\sqrt{2}\right)^3 \cdot \left(\sqrt{5}\right)^3}{\left(5\sqrt{2}\right)^2}$

Sol: $\frac{2\sqrt{5}}{5}$

 $\text{(h)} \quad \frac{9^{\frac{1}{2} \cdot 3^{-1} \cdot 2^{\frac{3}{2}}}}{\sqrt{2}}$

Sol: 2

2. p6e13 - Calcula los siguientes radicales:

(a) $\sqrt{16}$

Sol: 4

(c) $\sqrt[3]{27}$

Sol: 3

(e) $\sqrt{1225}$

Sol: 35

(b) $\sqrt[4]{-16}$

Sol: $2\sqrt[4]{-1}$

(d) $\sqrt[5]{-1}$

Sol: $\sqrt[5]{-1}$

(f) $\sqrt[7]{1}$

Sol: 1

3. p6e14 - Resuelve las siguientes ecuaciones:

(a) $x^4 = 81$

Sol: $x^4 = 81$

Sol: $x^3 = 125$

Sol: $x^2 = -6$

(b) $x^3 = 125$

(c) $x^2 = -6$

(d) $x^5 = -1$

Sol: $x^5 = -1$

- 4. p6e15 Calcula y expresa el resultado de la forma más simple:
 - (a) $\sqrt{27} \cdot \sqrt{243} \cdot \sqrt{81}$

Sol: 729

Sol: 5

Sol: $25\sqrt[3]{5}$

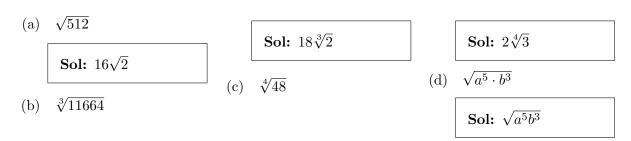
(b) $\frac{\sqrt[3]{625}}{\sqrt[3]{5}}$

(c) $(\sqrt[3]{5})^7$

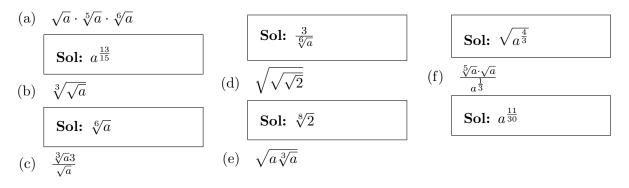
(d) $\sqrt[3]{\sqrt{8}}$

Sol: $\sqrt{2}$

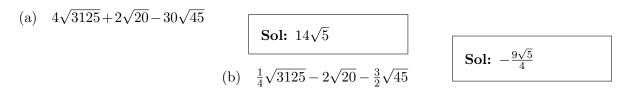
5. p6e16 - Extrae factores fuera del signo radical en:



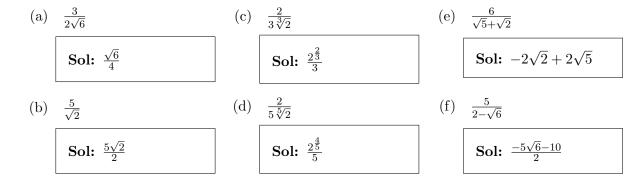
6. p6e17 - Calcula y expresa el resultado como potencia de exponente racional:



7. p6e18 - Calcula:



8. p6e19 - Racionaliza:



9. p6e23 - Calcula, descomponiendo el radicando en factores primos:

(a) $\sqrt{729}$,			
		Sol: 27		Sol: 40
	(b)	$\sqrt[3]{64000}$	(c)	$\sqrt[4]{50625}$

Sol: 15

(d) $\sqrt[5]{59049}$

Sol: 9

10. p6e25 - Calcula:

(a)
$$5\sqrt{8} - 2\sqrt{50} + \sqrt{32} - \sqrt{2}$$

(a)
$$5\sqrt{8} - 2\sqrt{50} + \sqrt{32} - \sqrt{2}$$
 (b) $\sqrt{27} - \frac{1}{4}\sqrt{12} + \frac{2}{5}\sqrt{75}$

Sol: $\frac{9\sqrt{3}}{2}$

Sol: $3\sqrt{2}$

(c) $\sqrt{\frac{2}{9}} + \sqrt{8} - \sqrt{\frac{1}{8}}$

Sol: $\frac{\sqrt{2}}{3}$

11. p6e26 - Calcula y simplifica:

(a)
$$\sqrt[3]{5} \cdot \sqrt[4]{3} \cdot \sqrt{2}$$

Sol: $\sqrt{2}\sqrt[4]{3}\sqrt[3]{5}$

 $\frac{\sqrt[3]{5}\cdot\sqrt{3}}{\sqrt{15}\cdot\sqrt{6}}$ (b)

Sol: $\frac{5^{\frac{5}{6}}\sqrt{6}}{30}$

 $\frac{\sqrt[6]{5}}{\sqrt[3]{5}}$ (c)

Sol: $\frac{5^{\frac{5}{6}}}{5}$

 $\sqrt[5]{27^{\frac{5}{3}}}$ (d)

Sol: 3

(e) $\sqrt[3]{4} \cdot \sqrt[4]{8} \cdot \sqrt{2}$

Sol: $2 \cdot 2^{\frac{11}{12}}$

12. p6e27 - Efectúa:

(a)
$$\sqrt[3]{5} \cdot \sqrt[3]{5^2}$$

Sol: 5

(b)

Sol: $\frac{\sqrt[3]{x^2y^3}}{\sqrt[3]{xy}}$

 $(\sqrt[5]{3^2})^4$ (c)

Sol: $3 \cdot 3^{\frac{3}{5}}$

 $\sqrt[3]{5}\cdot\sqrt[4]{5^2}$ (d)

Sol: $5^{\frac{5}{6}}$

(e) $3\sqrt{5} \cdot 2\sqrt[3]{25}$

Sol: $30\sqrt[6]{5}$

 $\sqrt[3]{a^3b} \cdot \sqrt[6]{ab^4}$ (f)

Sol: $\sqrt[6]{ab^4}\sqrt[3]{a^3b}$

 $3\sqrt[4]{2}\cdot\sqrt{8}$ (g)

Sol: $6 \cdot 2^{\frac{3}{4}}$

 $\frac{\sqrt[4]{x^3y^3}}{\sqrt[3]{xy}}$ (h)

Sol: $\frac{\sqrt[4]{x^3y^3}}{\sqrt[3]{xy}}$

 $\frac{4\sqrt[4]{6}}{2\sqrt{3}}$ (i)

Sol: $\frac{2\sqrt[4]{2} \cdot 3^{\frac{3}{4}}}{3}$

 $\frac{6\sqrt[3]{5}}{2\sqrt{10}}$ (j)

Sol: $\frac{3\sqrt{2}\cdot 5^{\frac{5}{6}}}{10}$

 $\frac{\sqrt[5]{(a+b)^3}}{\sqrt{a+b}}$ (k)

Sol: $\frac{\sqrt{a+b}\sqrt[5]{(a+b)^3}}{a+b}$

(1) $\sqrt[3]{x^2} \cdot \frac{\sqrt[5]{xy}}{\sqrt{xy^3}}$

Sol: $\frac{\sqrt[5]{xy}\sqrt{xy^3}\sqrt[3]{x^2}}{xy^3}$

 $\sqrt[3]{\sqrt[4]{a}}$ (m)

Sol: $\sqrt[12]{a}$

(n) $\sqrt[3]{x^2\sqrt[5]{x^3}}$

Sol: $\sqrt[6]{x^2\sqrt[5]{x^3}}$

(ñ)
$$\sqrt{n\sqrt[5]{n\sqrt[6]{n}}}$$

Sol:
$$\sqrt{n\sqrt[5]{n^{\frac{7}{6}}}}$$

13. p6e28 - Racionaliza:

(a)
$$\frac{3}{\sqrt{5}}$$

Sol: $\frac{3\sqrt{5}}{5}$

(b) $\frac{12}{\sqrt{8}}$

Sol: $3\sqrt{2}$

(c) $\frac{5}{\sqrt{5}}$

Sol: $\sqrt{5}$

(d) $\frac{a}{\sqrt[3]{a^2}}$

Sol: $\frac{a}{\sqrt[3]{a^2}}$

(e) $\frac{x^2}{\sqrt[4]{x}}$

Sol: $x^{\frac{7}{4}}$

(f) $\frac{abc}{\sqrt{abc}}$

Sol: $\frac{\sqrt{abc^3}}{c^2}$

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

Sol: $-5\sqrt{3} + 10$

 $\left(h\right) \quad \frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$

Sol: $-(-\sqrt{3}+\sqrt{2})^2$

 $(i) \quad \tfrac{2-\sqrt{2}}{2+\sqrt{2}}$

Sol: $\frac{(-\sqrt{2}+2)^2}{2}$

 $(j) \quad \frac{1}{\sqrt{\sqrt{2}}}$

Sol: $\frac{2^{\frac{3}{4}}}{2}$

 $(k) \quad \frac{a}{\sqrt{a} + \sqrt{b}}$

Sol: $\frac{a^{\frac{3}{2}}-a\sqrt{b}}{a-b}$