**Verifica di matematica classe 2°**
di Alice Tosi

*Semplifica i radicali*

1. $\sqrt[4]{\frac{4x^2+4+8x}{9}} = \sqrt[4]{\frac{4(x^2+1+2x)}{3^2}} = \sqrt[4]{\frac{2^2(x+1)^2}{3^2}} = \sqrt[\cancel{4}^2]{\frac{2^{\cancel{2}}(x+1)^{\cancel{2}}}{3^{\cancel{2}}}} = \sqrt{\frac{2(x+1)}{3}}$

2. $\sqrt[12]{\frac{81a^2b^4}{x^2}} = \sqrt[12]{\frac{3^4a^2b^4}{x^2}} = \sqrt[\cancel{12}^6]{\frac{3^{\cancel{4}^2}a^{\cancel{2}}b^{\cancel{4}^2}}{x^{\cancel{2}}}} = \sqrt[6]{\frac{3^2ab^2}{x}}$

*Esegui le operazioni*

3. $\sqrt{\frac{1+a}{a^2}}\cdot\sqrt{\frac{a^2+1+2a}{2}}:\sqrt{\frac{4}{a^2}} = \sqrt{\frac{a+1}{a^2}}\cdot\sqrt{\frac{(a+1)^2}{2}}:\sqrt{\frac{4}{a^2}} = \sqrt{\frac{(a+1)}{a^2}\cdot\frac{(a+1)^2}{2}\cdot\frac{a^2}{4}} =$

$\sqrt{\frac{(a+1)}{\cancel{a^2}}\cdot\frac{(a+1)^2}{2}\cdot\frac{\cancel{a^2}}{4}} = \sqrt{\frac{(a+1)^3}{8}} = \sqrt{\frac{(a+1)^3}{2^3}} = \sqrt{\frac{(a+1)^2\cdot(a+1)}{2^2\cdot 2}} = \frac{(a+1)}{2}\sqrt{\frac{(a+1)}{2}}$

4. $\sqrt[3]{\frac{x^2y+xy^2}{4x^3}}\cdot\sqrt[4]{\frac{x^2+y^2-2xy}{x^2+y^2+2xy}}:\sqrt[6]{\frac{(x-y)^3}{4x^3}} = \sqrt[3]{\frac{\cancel{x}y(x+y)}{4x^{\cancel{3}^2}}}\cdot\sqrt[4]{\frac{(x-y)^2}{(x+y)^2}}:\sqrt[6]{\frac{(x-y)^3}{4x^3}} =$

$=\sqrt[12]{\frac{y^4(x+y)^4}{4^4x^8}\cdot\frac{(x-y)^6}{(x+y)^6}\cdot\frac{4^2x^6}{(x-y)^6}} = \sqrt[12]{\frac{y^4\cancel{(x+y)^4}}{4^{\cancel{4}^2}x^{\cancel{12}^2}}\cdot\frac{\cancel{(x-y)^6}}{(x+y)^{\cancel{6}^2}}\cdot\frac{\cancel{4^2}x^{\cancel{6}}}{\cancel{(x-y)^6}}}$

$=\sqrt[12]{\frac{y^4}{4^2x^2(x+y)^2}} = \sqrt[6]{\frac{y^2}{4x(x+y)}}$

*Trasporta sotto radice*

5. $2(x-y)\cdot\sqrt{\frac{1}{4x^2-4y^2}} = 2(x-y)\cdot\sqrt{\frac{1}{4(x-y)(x+y)}} = \sqrt{2^2(x-y)^2\cdot\frac{1}{4(x-y)(x+y)}} =$

$=\sqrt{\frac{4(x-y)^2}{4(x-y)(x+y)}} = \sqrt{\frac{(x-y)}{(x+y)}}$

*Trasporta fuori dalla radice*

6. $x\cdot\sqrt{\frac{28}{x^4(x+y)^2}} = x\cdot\sqrt{\frac{2^2\cdot 7}{x^4(x+y)^2}} = x\cdot\frac{2}{x^2(x+y)}\sqrt{7} = \frac{2}{x(x+y)}\sqrt{7}$

*Esegui le operazioni*

7. $\sqrt[3]{8}-2\cdot\sqrt[3]{\frac{2}{27}}+5\cdot\sqrt[6]{4}-7\cdot\sqrt[3]{2} = \sqrt[3]{2^3}-2\sqrt[3]{\frac{2}{3^3}}+5\sqrt[6]{2^2}-7\sqrt[3]{2} = 2-\frac{2}{3}\sqrt[3]{2}+5\sqrt[3]{2}-7\sqrt[3]{2} = 2-\frac{8}{3}\sqrt[3]{2}$

8. $\left(\frac{1}{2}x-\sqrt{3}b\right)^2 = \frac{1}{4}x^2+3b^2-\sqrt{3}bx$

9. $\left(\sqrt[3]{3}+1\right)^3$

$\left(\sqrt[3]{3}\right)^3+3\cdot\left(\sqrt[3]{3}\right)^2\cdot 1+3\cdot\left(\sqrt[3]{3}\right)\cdot(1)^2+1^3 \quad =$

$3+3\sqrt[3]{3^2}+3\sqrt[3]{3} \;+1$

$4+3\sqrt[3]{9}+3\sqrt[3]{3}$

10. $\left(1-\sqrt{2}\right)^2+\left(2\sqrt{2}-3\right)^2-\left(3\sqrt{2}-4\right)\left(4+3\sqrt{2}\right) \quad =$

$1+2-2\sqrt{2} \quad +8+9-12\sqrt{2} \quad -(18-16) \quad =$

$1+2-2\sqrt{2}+8+9-12\sqrt{2}-2$

$16-14\sqrt{2}=2\left(8-7\sqrt{2}\right)$

*Razionalizza il denominatore*

11. $\frac{\sqrt{3}}{\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}=\frac{\sqrt{15}}{5}$

12. $\frac{\sqrt{2}+1}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}=\frac{2+\sqrt{2}}{2}$

13. $\frac{6}{\sqrt{7}-\sqrt{5}} \;=\frac{6}{\sqrt{7}-\sqrt{5}}\cdot\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}+\sqrt{5}}=\frac{6\sqrt{7}+6\sqrt{5}}{7-5}=\frac{6\sqrt{7}+6\sqrt{5}}{2}=\frac{6\left(\sqrt{7}+\sqrt{5}\right)}{2}=3\left(\sqrt{7}+\sqrt{5}\right)$

14. $\frac{2}{\sqrt[3]{2}-1} \;=\frac{2}{\sqrt[3]{2}-1}\cdot\frac{\sqrt[3]{2^2}+\sqrt[3]{2}+1^2}{\sqrt[3]{2^2}+\sqrt[3]{2}+1^2}=\frac{2\sqrt[3]{2^2}+2\sqrt[3]{2}+2}{\left(\sqrt[3]{2}\right)^3-1^3}=2\left(\sqrt[3]{2^2}+\sqrt[3]{2}+1\right)$

*Radicale doppio*

15. $\sqrt{\sqrt{7}+4}$

$\sqrt{4+\sqrt{7}}=\sqrt{\frac{4+\sqrt{16-7}}{2}}+\sqrt{\frac{4-\sqrt{16-7}}{2}}=\sqrt{\frac{4+\sqrt{9}}{2}}+\sqrt{\frac{4-\sqrt{9}}{2}}=\sqrt{\frac{4+3}{2}}+\sqrt{\frac{4-3}{2}}=\sqrt{\frac{7}{2}}+\sqrt{\frac{1}{2}}$