

DDR - Niveau 1 TES - Ensembles

1) $A = [-5; 9[$, $B =]3; \infty[$ $C = [-4; 13]$
 $B \cap C =]3; 13]$ $A \cup B \cup C = [-5; +\infty[$ $\bar{A} =]-\infty; -5[\cup]9; +\infty[$

2) $A = \{x \in \mathbb{R} \mid 4 \leq x^2 < 13\} = [-\sqrt{13}; -2] \cup [2; \sqrt{13}[$

3) $x^2 + 6x + 11 = (x+3)^2 - 9 + 11 = (x+3)^2 + 2$
 $x^2 - 4x - 9 = (x-2)^2 - 4 - 9 = (x-2)^2 - 13$

4) $\sqrt{27} = \sqrt{3 \cdot 9} = 3\sqrt{3}$

$$\frac{2+\sqrt{3}}{3-\sqrt{3}} = \frac{(2+\sqrt{3})(3+\sqrt{3})}{(3-\sqrt{3})(3+\sqrt{3})} = \frac{(2+\sqrt{3})(3+\sqrt{3})}{9-3} = \frac{6+3\sqrt{3}+2\sqrt{3}+3}{6} = \frac{9+5\sqrt{3}}{6}$$

$$\sqrt{6+\sqrt{11}} \cdot \sqrt{6-\sqrt{11}} = \sqrt{6^2-11} = \sqrt{36-11} = \sqrt{25} = 5$$

5) $\sqrt[n]{a} : \sqrt[m]{a} = \frac{a^{1/n}}{a^{1/m}} = a^{1/n - 1/m} = a^{3/10}$

$$\frac{(a^4)^3}{a^{-2}} = a^{12} \cdot a^2 = a^{14}$$

6) $2x^3 - 4x = 0 \Leftrightarrow 2x(x^2 - 2) = 0 \Leftrightarrow \begin{matrix} x=0 \\ x^2-2=0 \Leftrightarrow x=\pm\sqrt{2} \end{matrix}$
 $(x-5)^2 - 2 = 7 \Leftrightarrow (x-5)^2 = 9 \quad \begin{cases} x-5=3 \Leftrightarrow x_1=8 \\ x-5=-3 \Leftrightarrow x_2=2 \end{cases}$

*) $81x^4 - 4 = (9x^2)^2 - 2^2 = (9x^2 - 2)(9x^2 + 2) = (3x - \sqrt{2})(3x + \sqrt{2})(9x^2 + 2)$
 $4x^2 - 20x + 25 = (2x - 5)^2$