2.7 Notes

Wednesday, June 19, 2019 1:14 PM

Method 4: Quadratic Formula

$ax^2+bx+c=\text{☺}$ $\quad x=\dfrac{-b\pm\sqrt{b^2-4ac}}{2a}$

$x^2+4x+1=0$ (A = 4, M = 1)

$a=1 \quad b=4 \quad c=1$

$x=\dfrac{-(4)\pm\sqrt{(4)^2-4(1)(1)}}{2(1)}$

$=\dfrac{-4\pm\sqrt{16-4}}{2}=\dfrac{-4\pm\sqrt{12}}{2}$

$\sqrt{12}=\sqrt{4}\cdot\sqrt{3}=2\sqrt{3}$

$=\dfrac{-4\pm2\sqrt{3}}{2}$

$=\dfrac{-4}{2}\pm\dfrac{2\sqrt{3}}{2}$

$x=-2\pm\sqrt{3}$

OR

$x=-2+\sqrt{3},\ -2-\sqrt{3}$

Method 5: Complex Solutions

$x^2+9=0$

$-9 \quad -9$

$\sqrt{x^2}=\pm\sqrt{-9}$

$x=\pm\sqrt{-9}$

$\pm\sqrt{9}\ \sqrt{-1}$

$\pm 3\ i$

$x=\pm3i$ or $x=3i,-3i$

$x^2-9=0$

(DOTS)

$(x+3)(x-3)=0$

Method 6: Rational Exponents (fractions)

$2x^{3/2}+5=133$

$-5 \quad -5$

$2x^{3/2}=128$

$\dfrac{2x^{3/2}}{2}=\dfrac{128}{2}$

$x^{3/2}=64$

$2x+5=133$

$-5 \quad -5$

$\dfrac{2x}{2}=\dfrac{128}{2}$

$x=64$

$v^{3/2}=64$

$\left(x^{3/2}\right)^{2/3}=(64)^{2/3}$

* raise both sides to the reciprocal exponent

$x^{3/2} = 64$

$\sqrt{x^3}^2 = 64^2$

$\sqrt[3]{x^3} = \sqrt[3]{4096}$

$x = 16$

$\left(x^{3/2}\right) = (64)^{\cdot}$ * raise both sides to the reciprocal exponent

$x = 64^{2/3} = \sqrt[3]{64^2} = \sqrt[3]{4096}$

$x = 16$

$x^{\frac{A}{B}} = \sqrt[B]{x^A}$