**The Quadratic Formula - Answers**

A general quadratic equation: $ax^{2}+bx+c=0$

The quadratic formula: $x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$

Fill in the blanks below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Equation** | **Quadratic formula** | **Simplified** | **Solutions (**$2$**dp)** |
| $$x^{2}+4x+2=0$$ | $$\frac{-\left(4\right)\pm \sqrt{\left(4\right)^{2}-4\left(1\right)\left(2\right)}}{2\left(1\right)}$$ | $$x=\frac{-4\pm \sqrt{8}}{2}$$ | $x=-0.59$ and $x=-3.41$ |
| $$x^{2}-5x+3=0$$ | $$\frac{-\left(-5\right)\pm \sqrt{\left(-5\right)^{2}-4\left(1\right)\left(3\right)}}{2\left(1\right)}$$ | $$x=\frac{5\pm \sqrt{13}}{2}$$ | $x=4.30$ and $x=0.70$ |
| $$x^{2}+x-3=0$$ | $$\frac{-\left(1\right)\pm \sqrt{\left(1\right)^{2}-4\left(1\right)\left(-3\right)}}{2\left(1\right)}$$ | $$x=\frac{-1\pm \sqrt{13}}{2}$$ | $x=1.30$ and $x=-2.30$ |
| $$2x^{2}+7x+1=0$$ | $$\frac{-\left(7\right)\pm \sqrt{\left(7\right)^{2}-4\left(2\right)\left(1\right)}}{2\left(2\right)}$$ | $$x=\frac{-7\pm \sqrt{41}}{4}$$ | $x=-0.15$ and $x=-3.35$ |
| $$3x^{2}-5x-4=0$$ | $$\frac{-\left(-5\right)\pm \sqrt{\left(-5\right)^{2}-4\left(3\right)\left(-4\right)}}{2\left(3\right)}$$ | $$x=\frac{5\pm \sqrt{73}}{6}$$ | $x=2.26$ and $x=-0.59$ |
| $$x^{2}+3x+1=0$$ | $$\frac{-\left(3\right)\pm \sqrt{\left(3\right)^{2}-4\left(1\right)\left(1\right)}}{2\left(1\right)}$$ | $$x=\frac{-3\pm \sqrt{5}}{2}$$ | $x=-0.38$ and $x=-2.61$ |
| $$x^{2}-2x-5=0$$ | $$\frac{-\left(-2\right)\pm \sqrt{\left(-2\right)^{2}-4\left(1\right)\left(-5\right)}}{2\left(1\right)}$$ | $$x=\frac{2\pm \sqrt{24}}{2}$$ | $x=3.45$ and $x=-1.45$ |
| $$2x^{2}-6x+1=0$$ | $$\frac{-\left(-6\right)\pm \sqrt{\left(-6\right)^{2}-4\left(2\right)\left(1\right)}}{2\left(2\right)}$$ | $$x=\frac{6\pm \sqrt{28}}{4}$$ | $x=2.82$ and $x=0.18$ |

Can you link each quadratic formula below to each function?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function** |  | **Equation** |  | **Quadratic formula** |
|  |  | $$y=x^{2}-4x+3$$ |  | $$x=\frac{-3\pm \sqrt{1}}{2}$$ |
|  |  | $$y=x^{2}+3x+2$$ |  | $$x=\frac{4\pm \sqrt{0}}{2}$$ |
|  |  | $$y=x^{2}-x-2$$ |  | No solutions |
|  |  | $$y=x^{2}-4x+4$$ |  | $$x=\frac{4\pm \sqrt{4}}{2}$$ |
|  |  | $$y=x^{2}+2x+2$$ |  | $$x=\frac{1\pm \sqrt{9}}{2}$$ |