Quadratic Formula

The solutions of the quadratic equation $ax^2 + bx + c = 0$, where $a \neq 0$, are given by the **quadratic formula**

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

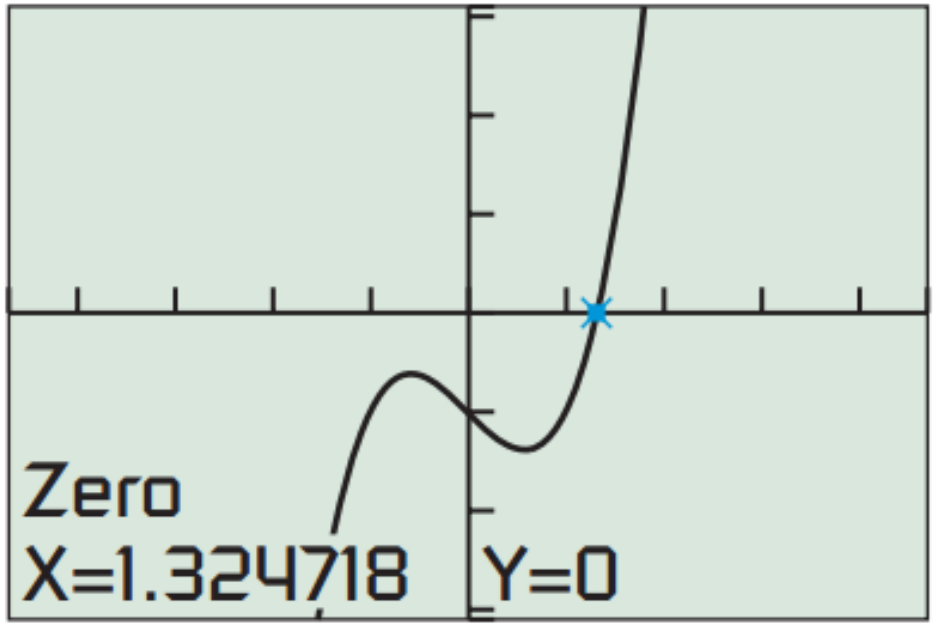
Solve the equation $3x^2 - 6x = 5$.

Solving Quadratic Equations Algebraically

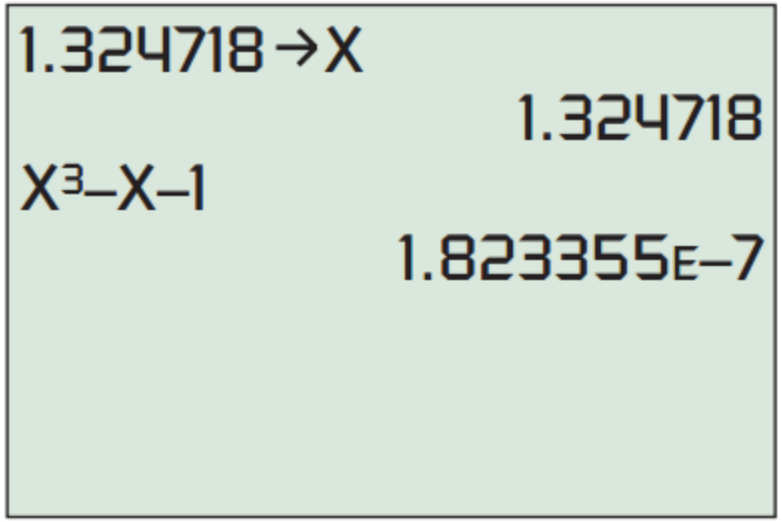
There are four basic ways to solve quadratic equations algebraically.

1. **Factoring**
2. **Extracting Square Roots**
3. **Completing the Square**
4. **Using the Quadratic Formula**

Solve the equation $x^3 - x - 1 = 0$ graphically.



[–4.7, 4.7] by [–3.1, 3.1]

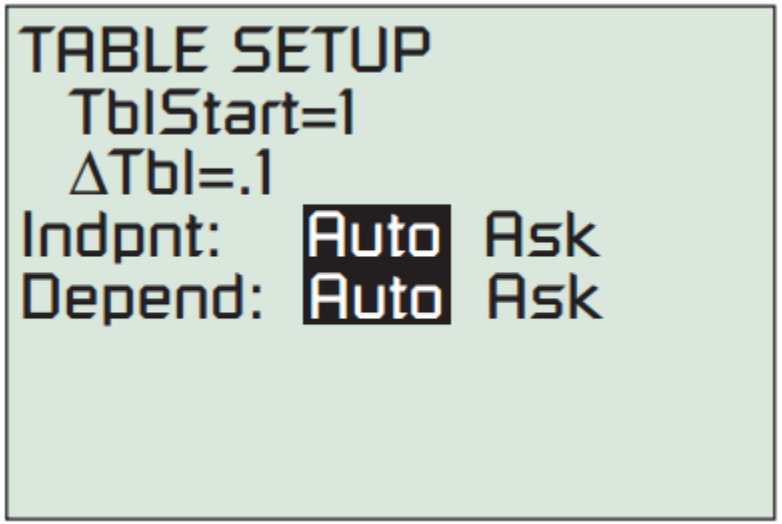


Agreement about Approximate Solutions

For applications, round to a value that is reasonable for the context of the problem. For all others round to two decimal places unless directed otherwise.

Solving Using Tables

Solve the equation $x^3 - x - 1 = 0$ using grapher tables.



X	Y_1	
1	−1	
1.1	−.769	
1.2	−.472	
1.3	−.103	
1.4	.344	
1.5	.875	
1.6	1.496	

$Y_1 = X^3 - X - 1$

X	Y_1	
1.3	−.103	
1.31	−.0619	
1.32	−.02	
1.33	.02264	
1.34	.0661	
1.35	.11038	
1.36	.15546	

$Y_1 = X^3 - X - 1$

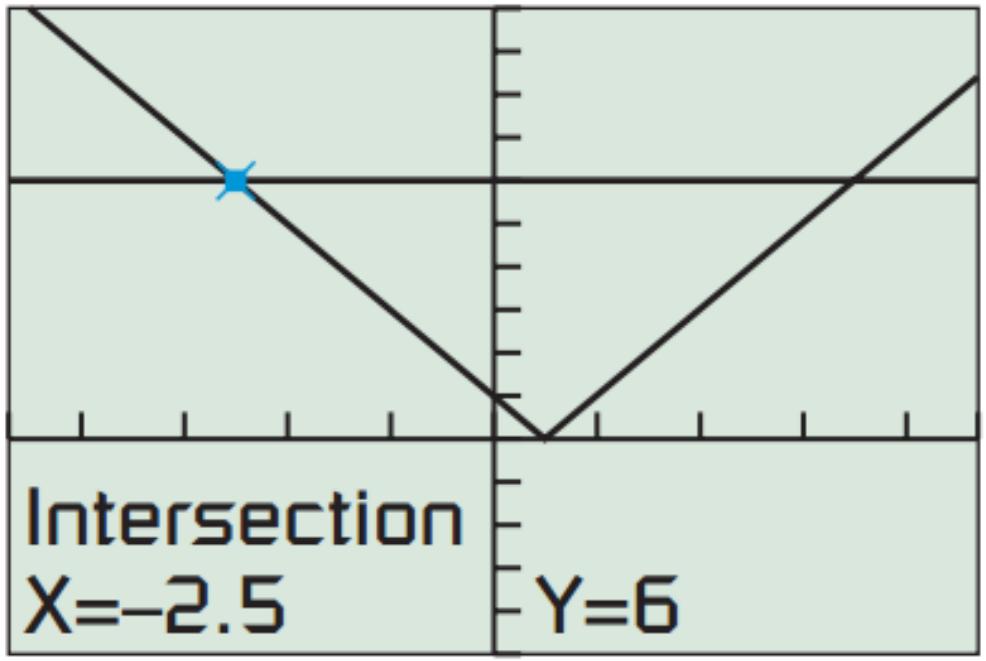
X	Y_1	
1.32	−.02	
1.321	−.0158	
1.322	−.0116	
1.323	−.0073	
1.324	−.0031	
1.325	.0012	
1.326	.00547	

$Y_1 = X^3 - X - 1$

Solving Equations by Finding Intersections

Sometimes we can rewrite an equation and solve it graphically by finding the *points of intersection* of two graphs. A point (a, b) is a **point of intersection** of two graphs if it lies on both graphs.

Solve the equation $|2x - 1| = 6$.



Solve: $|x| = |2x - 3|$