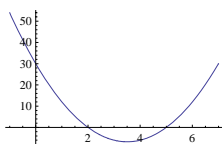


### ■ Plotting functions

```
Plot[3 (x - 2) (x - 5), {x, -1, 7}]
```



Common mistakes--using the wrong brackets.

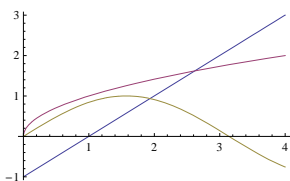
Use [ ] for the function Plot and all other functions.

Use { } for the list specifying the x values.

Use ( ) for math formulas.

### ■ Plotting several functions

```
Plot[{x - 1, Sqrt[x], Sin[x]}, {x, 0, 4}]
```



### ■ Solving algebraic equations

```
Solve[x - 1 == Sqrt[x], x]
```

```
{{x -> 1/2 (3 + Sqrt[5])}}
```

Tip: Get  $\sqrt{\quad}$  from the palette or by Ctrl+2. Or use Sqrt[x].

Pitfall: Using only one equal sign. You need a double equal == for equations.

Pitfall: Forgetting to say what variable you want solved for.

### ■ Solving transcendental equations

```
FindRoot[x - 1 == Sin[x], {x, 2}]
```

```
{x -> 1.93456}
```

Pitfall: Forgetting to give the initial guess.

### ■ Define a function

```
Clear[f, x]
```

```
f[x_] = x^2 - 7 x + 10;
```

Common mistake--forgetting the \_ after the x.

Tip: Hold down the Ctrl key when you type the ^ in  $x^2$ .

### ■ Use a function

```
Factor[f[x]]
```

```
(-5 + x) (-2 + x)
```

Common mistake--using f[x\_]. Use the \_ only when you first define the function.

### ■ Naming, getting decimals.

```
mySoln = Solve[x^3 + x + 1 == 0]
```

$$\left\{ \left\{ x \rightarrow -\left( \frac{2}{3(-9 + \sqrt{93})} \right)^{1/3} + \frac{\left( \frac{1}{2}(-9 + \sqrt{93}) \right)^{1/3}}{3^{2/3}} \right\}, \left\{ x \rightarrow -\frac{(1 + i\sqrt{3}) \left( \frac{1}{2}(-9 + \sqrt{93}) \right)^{1/3}}{2 \cdot 3^{2/3}} + \frac{1 - i\sqrt{3}}{2^{2/3} \left( 3(-9 + \sqrt{93}) \right)^{1/3}} \right\}, \right. \\ \left. \left\{ x \rightarrow -\frac{(1 - i\sqrt{3}) \left( \frac{1}{2}(-9 + \sqrt{93}) \right)^{1/3}}{2 \cdot 3^{2/3}} + \frac{1 + i\sqrt{3}}{2^{2/3} \left( 3(-9 + \sqrt{93}) \right)^{1/3}} \right\} \right\}$$

```
N[mySoln]
```

```
{{x -> -0.682328}, {x -> 0.341164 - 1.16154 i}, {x -> 0.341164 + 1.16154 i}}
```

### ■ Chapter 2 Homework

2.1 1, 3, 5, 9

2.2 1, 2, 3, 6, 7, 8, 15, 21, 25, 27

2.3 1, 2, 4, 10, 11, 13, 19, 20, 25, 28, 33, 48, 58

2.4 1, 2, 3, 4, 13, 17, 19, 21, 31, 37

2.5 1, 4, 6, 21, 23, 25, 27, 43b, 45, 49

2.6 1, 2, 3, 7, 15, 17, 21, 25, 28, 31, 33, 35, 51, 53, 58,

2.7 1, 3, 5, 11, 12, 13, 17, 19, 27, 35, 40, 43, 45, 49, 51

2.8 1, 3, 5, 11, 13, 16, 19, 25, 27, 33a, 35, 41, 43, 45, 51, 53, 55

### ■ Mathematica homework

Define the functions  $f(x) = x^2 + 3x + 1$  and  $g(x) = 10 - x^4$ .

Plot  $f$  and  $g$  on the same axes and estimate where they intersect.

Find decimal approximations for the two points  $(x, y)$  where the graphs intersect.