Mathematica Labs | iLearnMath.net | Denis Shubleka

Subject: Calculus

Topic: Plotting Lines and Planes

- Goal: Use *Mathematica* to visualize lines and planes.

Task 1

To plot a line in 2-space using its parametric equations:

```
ParametricPlot[{1 + 2 t, 1 - t}, {t, -10, 10}]
```

To plot a line in 3-space using parametric equations:

```
ParametricPlot3D[{1 + t, 1 - t, 2 + 3 t}, {t, -10, 10}]
```

To plot two lines in 3-space, separate the list of equations by commas:

```
ParametricPlot3D[{{1 + t, 1 - t, 2 + 3 t}, {3 + t, 2 + t, 2 - t}}, {t, -10, 10}]
```

Task 2

To plot a plane in 3-space using its general equation, we solve and plot z=f(x,y), with a specified domain for each independent variable x and y:

```
plot1 = Plot3D[x - y + 2, {x, -10, 10}, {y, -10, 10}, AxesLabel → {x, y, z}]
```

```
plot2 = ParametricPlot3D[{1 + t, 1 - t, 2 + 3 t}, {t, -10, 10}]
```

To show the different objects in the same plot, we use the Show command:

```
Show[plot1, plot2]
```

Related Exercises/Notes:
