```
> restart :
  a1 := 2;
   a2 := 0.5;

   a3 := -0.8; a4 := 1.5; a5 := 0.1;

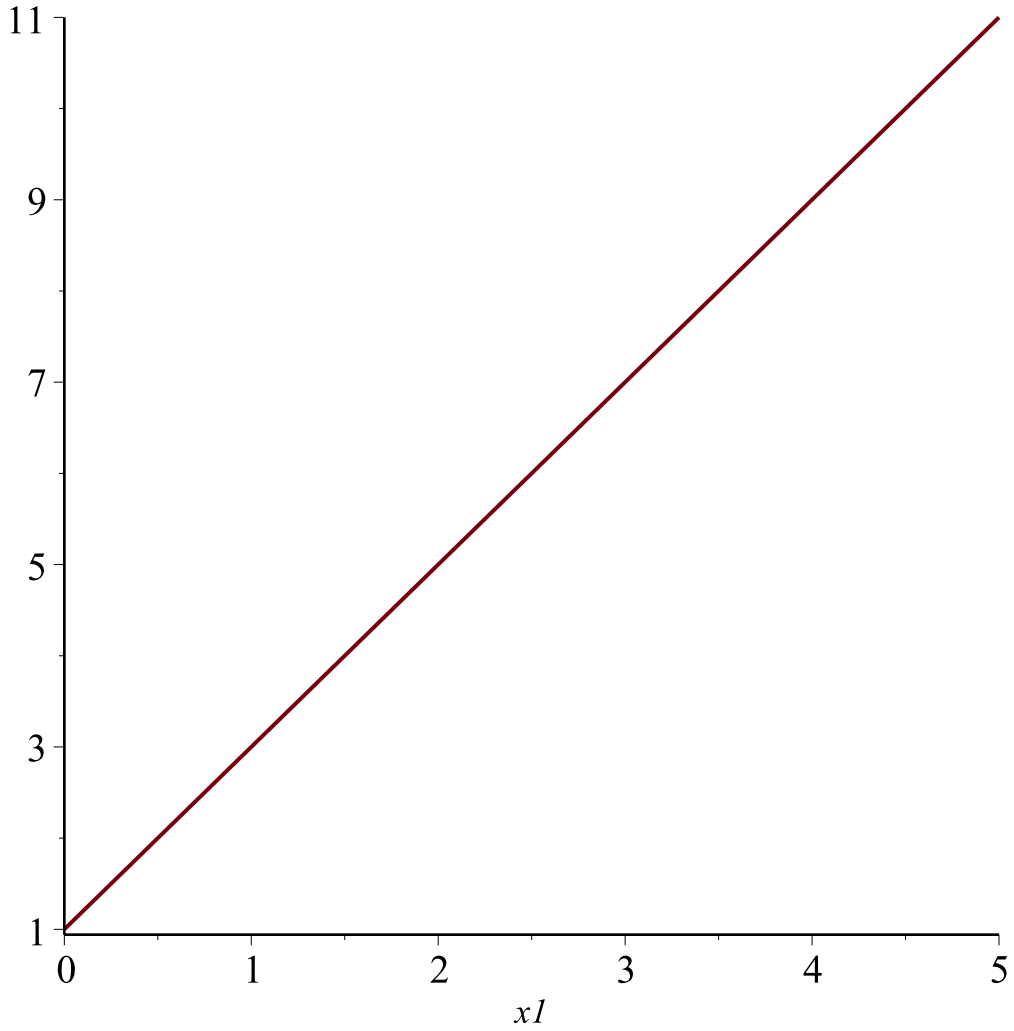
  a0 := 1;
   f2 := (x1, x2) → a1·x1 + a2·x2 + a0;
   f1 := (x1) → a1·x1 + a0;
    f3 := (x1, x2) → a3·x1 + a4·x2 + a5;
```

$$a1 := 2$$
$$a2 := 0.5$$
$$a3 := -0.8$$
$$a4 := 1.5$$
$$a5 := 0.1$$
$$a0 := 1$$
$$f2 := (x1, x2) \rightarrow a1\, x1 + a2\, x2 + a0$$
$$f1 := x1 \rightarrow a1\, x1 + a0$$
$$f3 := (x1, x2) \rightarrow a3\, x1 + a4\, x2 + a5 \qquad \textbf{(1)}$$

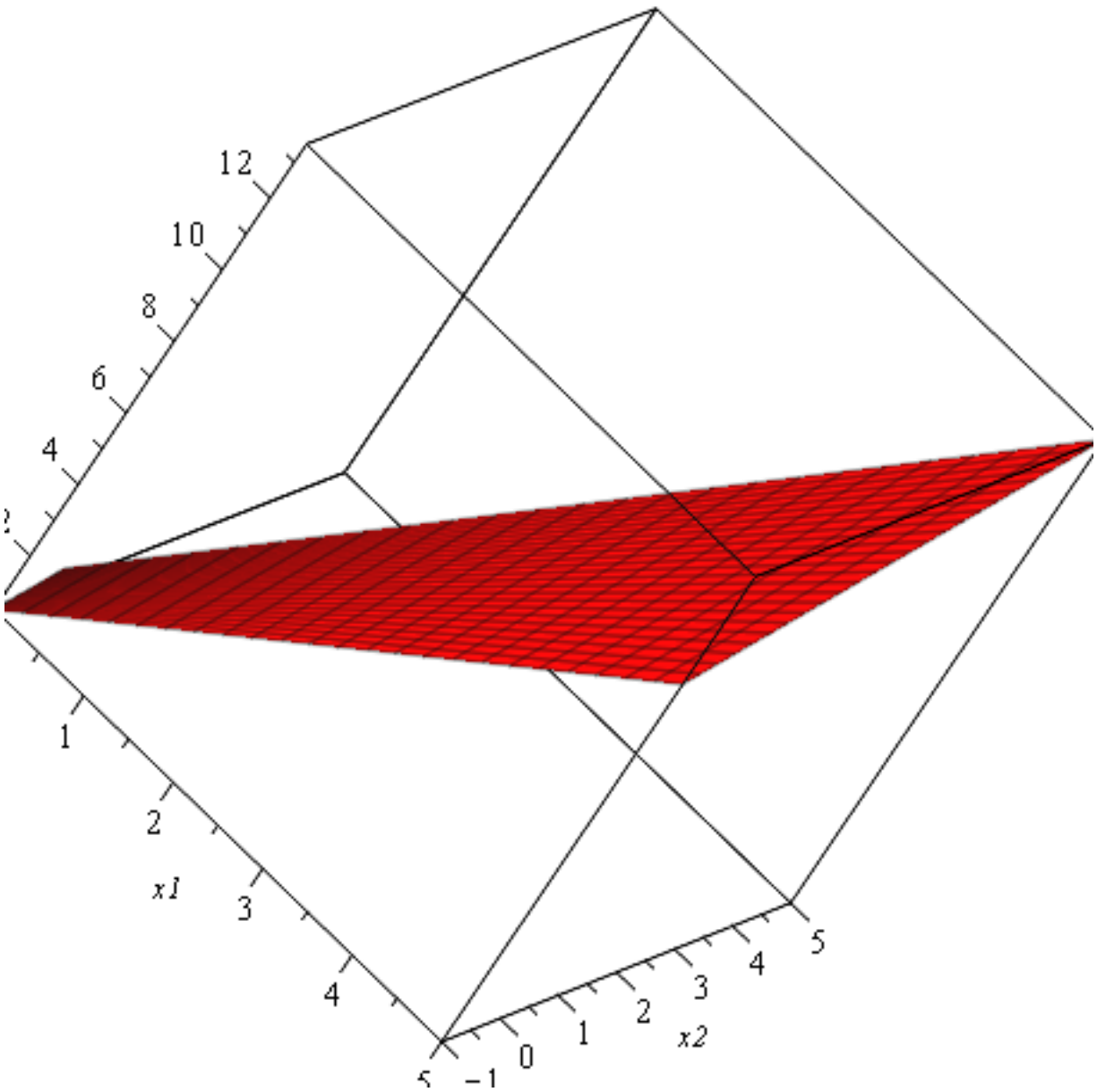
```
> f2(0, 0); f2(-1, 0); f2(-1, 5); f2(5, 5);
```

$$1.$$
$$-1.$$
$$1.5$$
$$13.5 \qquad \textbf{(2)}$$

```
> plot(f1(x1), x1 = 0..5);
```




```
> plot3d( { f2(x1, x2) }, x1 = 0 ..5, x2 =-1 ..x1, color = [red] );
```




```
> f2(1, 2); f1(1, 2);
```

4.0

3 **(3)**

```
> ?union
```

```
> restart :
  with(simplex) :
```

```
> obj := -x + y + 2 z;
```

$$obj := -x + y + 2\,z \quad \textbf{(4)}$$

> $C := \{ \le 23, 5x - 4y - 3z \le 10, 7x + 4y + 11z \le 30\};$

$$C := \{3x + 4y - 3z \le 23, 5x - 4y - 3z \le 10, 7x + 4y + 11z \le 30\} \quad (5)$$

> $maximize(obj, C \cup \{0 \le x, 0 \le y, 0 \le z\});$

$$\left\{x = 0, y = \frac{49}{8}, z = \frac{1}{2}\right\} \quad (6)$$

> $x := 0; y := \frac{49}{8}; z := \frac{1}{2};$

$$x := 0$$
$$y := \frac{49}{8}$$
$$z := \frac{1}{2} \quad (7)$$

> $obj;$

$$\frac{57}{8} \quad (8)$$

> $3x + 4y - 3z;$

$$23 \quad (9)$$

> $5x - 4y - 3z;$

$$-26 \quad (10)$$

> $7x + 4y + 11z;$

$$30 \quad (11)$$

> $with(simplex) :$
$obj := a1\,x1 + a2\,x2 + a0;$

$$obj := 2\,x1 + 0.5\,x2 + 1 \quad (12)$$

> $C := \{x1 \le 5, -x1 \le 0, -x2 \le 1, x2 \le x1\};$

$$C := \{x1 \le 5, x2 \le x1, -x1 \le 0, -x2 \le 1\} \quad (13)$$

> $maximize(obj, C);$

$$\{x1 = 5, x2 = 5\} \quad (14)$$