restart

Test Printing

```
restart
SignedArea := proc(a :: {Vector, list}, b :: {Vector, list}, c :: {Vector, list, null} := null)
  local M, A;
  description "signed area of a line segment or 3 points";
  if c = null then
    A := 1/2*a[1]*b[2] - 1/2*a[2]*b[1];
  else
    A := 1/2*(b[2] - c[2])*a[1] + 1/2*(-b[1] + c[1])*a[2]
      + 1/2*c[2]*b[1] - 1/2*c[1]*b[2];
  end if;
  return A;
end proc:

#with(RonanRoutines)
y := (x)->x^2
```

$$y := x \mapsto x^2 \tag{1}$$

```
A1 := [t1, y(t1)]
```

$$A1 := \left[t_1, t_1^2\right] \tag{2}$$

```
A2 := [t2, y(t2)]
```

$$A2 := \left[t_2, t_2^2\right] \tag{3}$$

```
A3 := [t3, y(t3)]
```

$$A3 := \left[t_3, t_3^2\right] \tag{4}$$

```
sA1A2A3 := SignedArea(A1, A2) + SignedArea(A2, A3) + SignedArea(A3, A1)
```

$$sA1A2A3 := \frac{1}{2}\,t_1\,t_2^2 - \frac{1}{2}\,t_1^2\,t_2 + \frac{1}{2}\,t_2\,t_3^2 - \frac{1}{2}\,t_2^2\,t_3 + \frac{1}{2}\,t_3\,t_1^2 - \frac{1}{2}\,t_3^2\,t_1 \tag{5}$$

```
factor
=
```

$$-\frac{(t_2 - t_3)\,(t_1 - t_3)\,(t_1 - t_2)}{2} \tag{6}$$

```
x1 := -2.5; x2 := 3.5;
t1 := -2; t2 := 1; t3 := 3;
iplt := plot(y(x), x = x1..x2, colour = blue):
trplt := plot([A1, A2, A3, A1], colour = green, ):
plots :- display(iplt, trplt);
unassign('t1','t2','t3');
```

$$x1 := -2.5$$

$$x2 := 3.5$$

$$t_1 := -2$$

$$t_2 := 1$$

$$t_3 := 3$$