

# Functions and Graphics

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## Moving Triangle

```
Graphics[{{Polygon[{{1, 2}, {3, 4}, {1, 3}}]}, Axes → True, PlotRange → 5]

mytri[x_] := Graphics[{{Polygon[{{1 + x, 2}, {3 + x, 4}, {1 + x, 3}}]}, Axes → True, PlotRange → 5]

mytri[0]

Show[mytri[0], mytri[1]]

Table[mytri[n], {n, -6, 6}]

Show[Table[mytri[n], {n, -6, 6}]]

Manipulate[mytri[n], {n, -6, 6}]

mytriColor[x_] :=
  Graphics[{{Hue[x/5], Polygon[{{1 + x, 2}, {3 + x, 4}, {1 + x, 3}}]}, Axes → True, PlotRange → 5]

Show[Table[mytriColor[n], {n, -6, 6}]]

Manipulate[mytriColor[n], {n, -6, 6}]
```

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## Functions with Module

```
Module[{mypoly, mylines},
  mypoly[x_] := Polygon[{{0 + x, 0}, {-1 + x, 2}, {1 + x, 1}, {2 + x, 1}}];
  mylines[x_, y_] := Line[{{-1 + x, 3 + y}, {2 + x, 1 + y}, {-1 + x, -2 + y}}];

  Graphics[{
    {Red, mypoly[0]},
    {Blue, mylines[0, 0]}
  ], Axes → True]

mypoly

mylines

glider[x2_, y2_] := Module[{mypoly, mylines},
  mypoly[x_] := Polygon[{{0 + x, 0}, {-1 + x, 2}, {1 + x, 1}, {2 + x, 1}}];
  mylines[x_, y_] := Line[{{-1 + x, 3 + y}, {2 + x, 1 + y}, {-1 + x, -2 + y}}];

  Graphics[{
    {Red, mypoly[x2]},
    {Blue, mylines[x2, y2]}
  ], Axes → True, PlotRange → {{-1, 12}, {-2, 5}}]

Manipulate[glider[x, y], {x, 0, 10}, {y, 0, 2}]

Manipulate[
  Show[glider[x, y], glider[x + 2, y]],
  {x, 0, 10}, {y, 0, 2}]

Manipulate[
  Show[Table[glider[x + 2 n, y], {n, 0, 4}]],
  {x, 0, 10}, {y, 0, 2}]
```

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