P6

PRACTICE 6: OTHER REPRESENTATIONS IN THE PLANE

```
Clear["Global´*"]
```

▼ Proposed Exercise P- 6.1

Using the command Table create the following points: (-5,25), (-4,16), (-3,9), (-2,4), (-1,1), (0, 0), (1, 1), (2, 4), (3, 9), (4, 16), (5, 25). Plot the points and the graphic obtained by joining them.

▼ Resolution P- 6.1
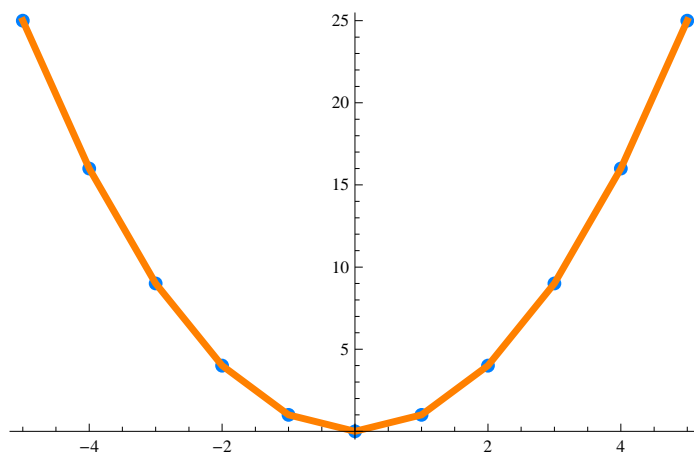
★ Creation of the points using Table

```
table = Table[{k, k^2}, {k, -5, 5, 1}]
```

```
{{-5, 25}, {-4, 16}, {-3, 9}, {-2, 4},
 {-1, 1}, {0, 0}, {1, 1}, {2, 4}, {3, 9}, {4, 16}, {5, 25}}
```

★ Plotting the points and the graphic obtained by joining them

```
g1 = ListPlot[table, PlotStyle → {PointSize[0.02], RGBColor[0, 0.5, 1]}];
```

```
g2 = ListPlot[table, Joined → True, PlotStyle → {Thickness[0.01], RGBColor[1, 0.5, 0]}];
```
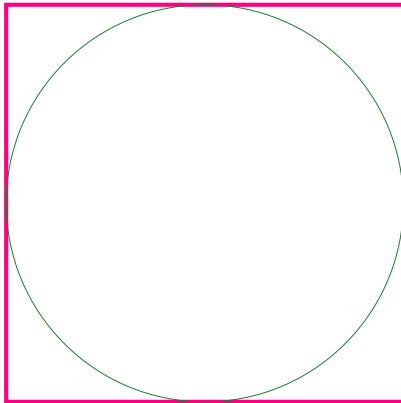
```
Show[g1, g2]
```


▼ Proposed Exercise P- 6.2

Plot the square with vertices (3,3), (-3,3), (-3,-3) and (3,-3) and the circle inscribed on it.
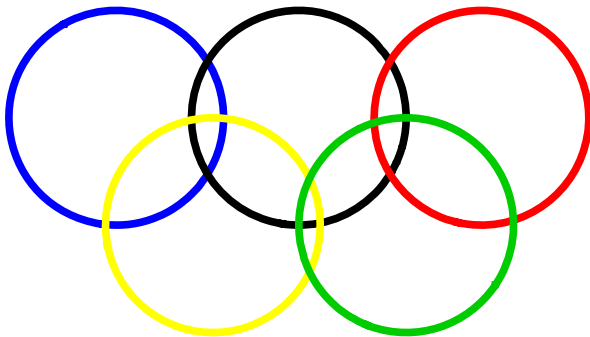
▼ **Resolution P- 6.2**

```
points = {{3, 3}, {-3, 3}, {-3, -3}, {3, -3}, {3, 3}};

sq = ListLinePlot[points, Joined -> True,
    PlotStyle -> {Thickness[0.01], RGBColor[1, 0, 0.5]}];

cir = Graphics[{RGBColor[0.1, 0.5, 0.2], Circle[{0, 0}, 3]}];

Show[sq, cir, Axes → False, AspectRatio → Automatic]
```


▼ **Proposed Exercise P- 6.3**

Write the necessary lines to obtain the next picture in Mathematica:

OLYMPIC FLAG

▼ **Resolution P- 6.3**

```
cc1[x_, y_, r_, a_, b_] = (x - a)² + (y - b)² == r²
```

$(-a + x)^2 + (-b + y)^2 == r^2$

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```
ContourPlot[{-1 + (-1.1 + x)² + (-2 + y)² == 0,
   -1 + (-2.8 + x)² + (-2 + y)² == 0, -1 + (-4.5 + x)² + (-2 + y)² == 0,
   -1 + (-2. + x)² + (-1 + y)² == 0, -1 + (-3.8 + x)² + (-1 + y)² == 0},
  {x, 0, 5.7}, {y, -0.1, 3.1}, AspectRatio → Automatic, Frame → False,
  ContourStyle → {{Thickness[0.012], Blue}, {Black, Thickness[0.012]},
     {Red, Thickness[0.012`]}, {Yellow, Thickness[0.012]},
     {RGBColor[0, 0.8, 0], Thickness[0.012]}}, PlotLabel → "OLYMPIC FLAG"]
```
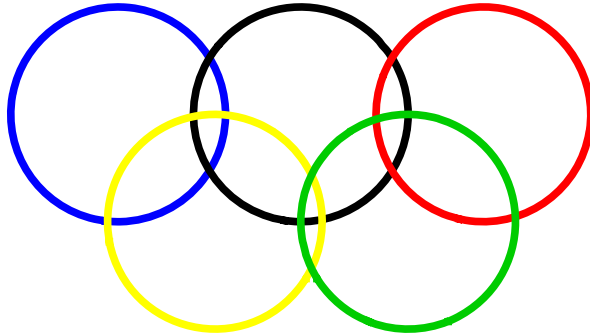

▼ Proposed Exercise P- 6.4

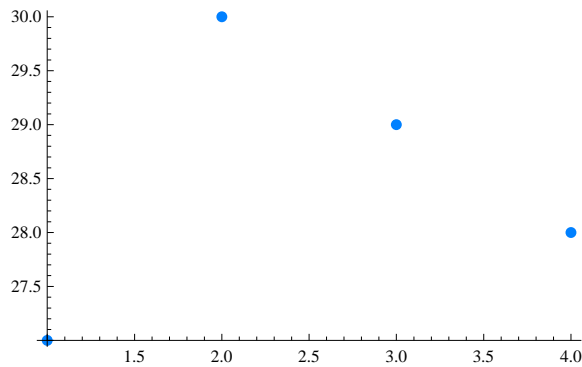**Write the necessary lines to obtain the next picture in Mathematica:**
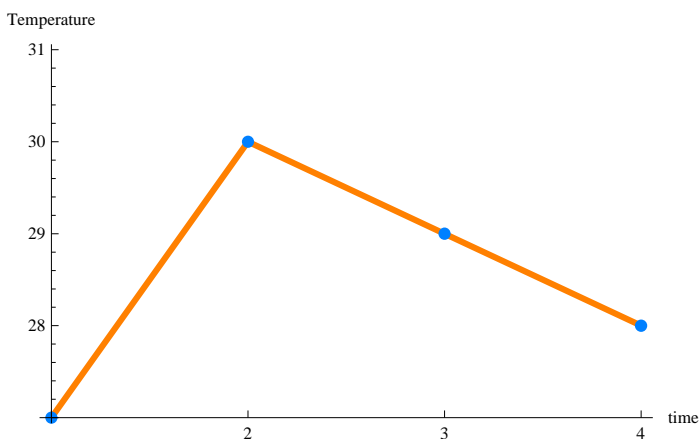
▼ Resolution P- 6.4

```
p1 = {{1, 27}, {2, 30}, {3, 29}, {4, 28}};
```
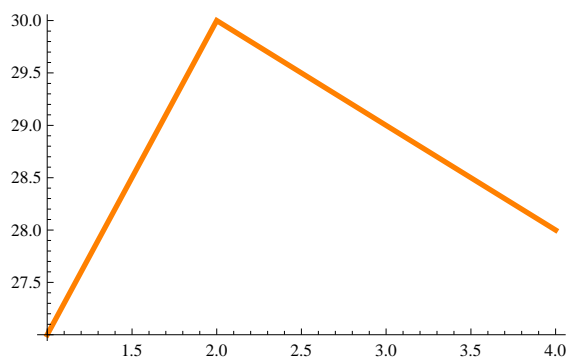
★ **Using LisPlot[table, PlotStyle → colour, PlotStyle → PointSize [n]] we can plot the points that have the colour and the size specified.**

```
g1 = ListPlot[p1, PlotStyle → {PointSize[0.02], RGBColor[0, 0.5, 1]}]
```


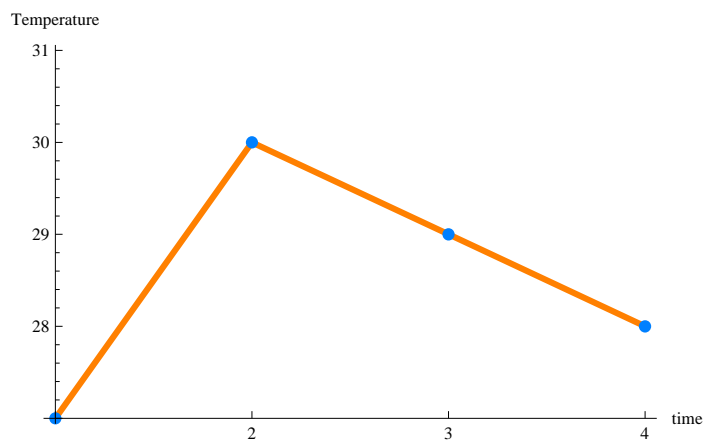★ **Use the following commands: Joined → True eta PlotStyle → {Thickness[n],RGBColor[1, 0.5, 0]}**

```
g2 = ListPlot[p1, Joined → True, PlotStyle → {Thickness[0.01], RGBColor[1, 0.5, 0]}]
```


★ **AxesLabel → *name***

```
Show[g2, g1, PlotRange → {27, 31},
 AxesLabel → {"time", "Temperature"}, Ticks → {{1, 2, 3, 4}, Automatic}]
```
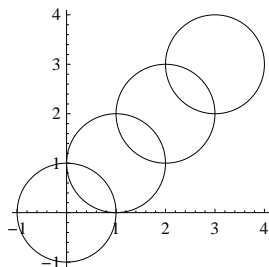

▼ **Proposed Exercise P- 6.5**

**Write the necessary lines to obtain the next picture in Mathematica:**

▼ Resolution P- 6.5

```
ci1 = Table[Circle[{a, a}, 1], {a, 0, 3, 1}]
```

```
{Circle[{0, 0}, 1], Circle[{1, 1}, 1], Circle[{2, 2}, 1], Circle[{3, 3}, 1]}
```

```
Graphics[ci1, Axes → True]
```
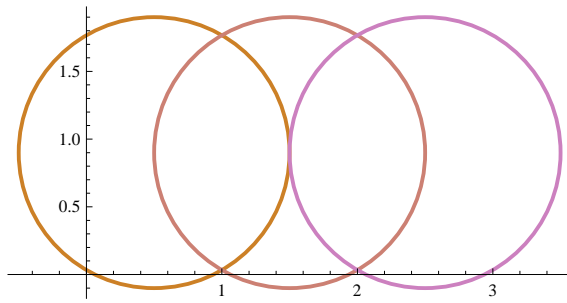


```
ci2 =
 Table[{Thickness[Large], RGBColor[a * 0.3, 0.8, 0.2], Circle[{a, 0}, 1]}, {a, 0, 3, 1}]
```

```
{{Thickness[Large], RGBColor[0., 0.8, 0.2], Circle[{0, 0}, 1]},
 {Thickness[Large], RGBColor[0.3, 0.8, 0.2], Circle[{1, 0}, 1]},
 {Thickness[Large], RGBColor[0.6, 0.8, 0.2], Circle[{2, 0}, 1]},
 {Thickness[Large], RGBColor[0.9, 0.8, 0.2], Circle[{3, 0}, 1]}}
```

```
g2 = Graphics[ci2, Axes → True]
```
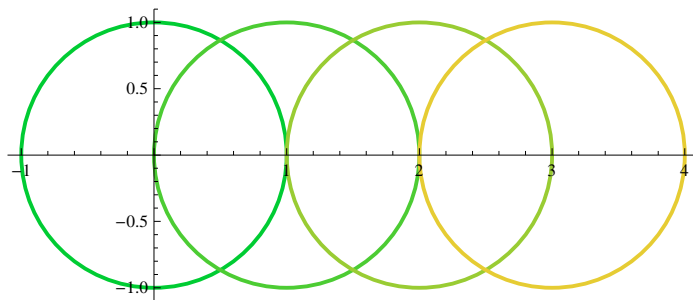


```
ci3 = Table[
  {Thickness[Large], RGBColor[0.8, 0.5, a * 0.3], Circle[{a, 0.9}, 1]}, {a, 0.5, 2.5, 1}]
```

```
{{Thickness[Large], RGBColor[0.8, 0.5, 0.15], Circle[{0.5, 0.9}, 1]},
 {Thickness[Large], RGBColor[0.8, 0.5, 0.45], Circle[{1.5, 0.9}, 1]},
 {Thickness[Large], RGBColor[0.8, 0.5, 0.75], Circle[{2.5, 0.9}, 1]}}
```
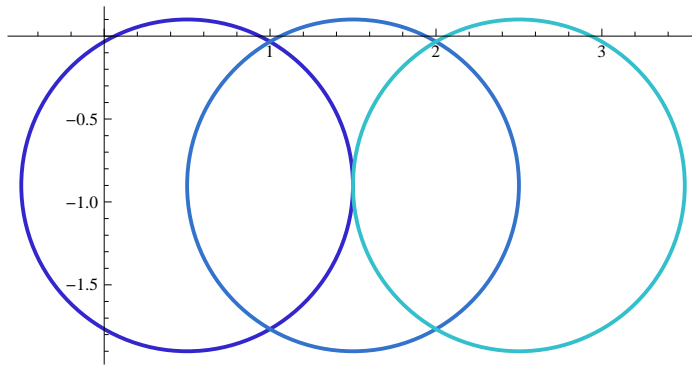
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g3 = Graphics[ci3, Axes → True]

ci4 = Table[
  {Thickness[Large], RGBColor[0.2, a * 0.3, 0.8], Circle[{a, -0.9}, 1]}, {a, 0.5, 2.5, 1}]

{{Thickness[Large], RGBColor[0.2, 0.15, 0.8], Circle[{0.5, -0.9}, 1]},
 {Thickness[Large], RGBColor[0.2, 0.45, 0.8], Circle[{1.5, -0.9}, 1]},
 {Thickness[Large], RGBColor[0.2, 0.75, 0.8], Circle[{2.5, -0.9}, 1]}}

g4 = Graphics[ci4, Axes → True]

Show[g2, g3, g4, Axes → False]

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