

Geometric Transformation Examples

Rotate and Translate Graphics

```
Graphics[{
  {Blue, Rectangle[{-2, -3}, {1, 2}]},
  {Red, Disk[{-1, -1}, 2]}
}, Axes → True, PlotRange → 10
]
```

```
Manipulate[
  Graphics[{
    {GeometricTransformation[
      {
        {Blue, Rectangle[{-2, -3}, {1, 2}]},
        {Red, Disk[{-1, -1}, 2]}
      },
      RotationTransform[t Degree, {0, 5}]}
    ], Axes → True, PlotRange → 10
  ],
  {t, 0, 360}]
```

```
Manipulate[
  Graphics[{
    {GeometricTransformation[
      {
        {Blue, Rectangle[{-2, -3}, {1, 2}]},
        {Red, Disk[{-1, -1}, 2]}
      },
      TranslationTransform[pt].RotationTransform[t Degree, {0, 5}]}
    ], Axes → True, PlotRange → 10
  ],
  {t, 0, 360}, {{pt, {0, 0}}, {-5, -5}, {5, 5}}
```

Define a Function to Create Multiple Copies of Object

```
myobject[{x_, y_}] := {GeometricTransformation[
  {
    {Blue, Rectangle[{-2, -3}, {1, 2}]},
    {Red, Disk[{-1, -1}, 2]}
  },
  TranslationTransform[{x, y}]]];
```

```
Graphics[{
  myobject[{1, 1}], myobject[{4, -2}], myobject[{-5, -5}]
}, Axes → True, PlotRange → 10
]
```

- **Note:** The same definition for "myobject" as above is used in each of the following inputs.

```
Graphics[{
  Table[myobject[{x, y}], {x, -8, 8, 4}, {y, -8, 8, 4}]
}, Axes → True, PlotRange → 10
]
```

```
Graphics[{
  myobject[{RandomInteger[{-8, 8}], RandomInteger[{-8, 8}]}]
}, Axes → True, PlotRange → 10
]
```

```
Graphics[{
  Table[myobject[{RandomInteger[{-8, 8}], RandomInteger[{-8, 8}]}], {4}]
}, Axes → True, PlotRange → 10
]
```

```
Manipulate[
  Graphics[{
    Table[myobject[{RandomInteger[{-8, 8}], RandomInteger[{-8, 8}]}], {number}]
  }, Axes → True, PlotRange → 10
],
{number, 1, 8, 1}]
```

```
objectlist = Map[myobject, Table[{RandomInteger[{-8, 8}], RandomInteger[{-8, 8}]}], {20}];
```

```
Manipulate[
  Graphics[{
    Take[objectlist, {1, number}]
  }, Axes → True, PlotRange → 10
],
{number, 1, 8, 1}]
```
