

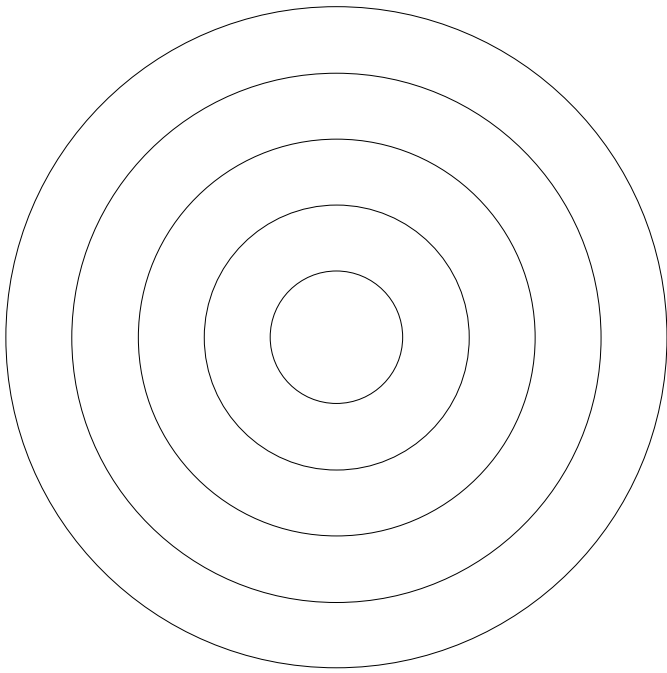
# Rania — PS 5 — 2025-02-04

## EIWL3 Sections 14 and 17

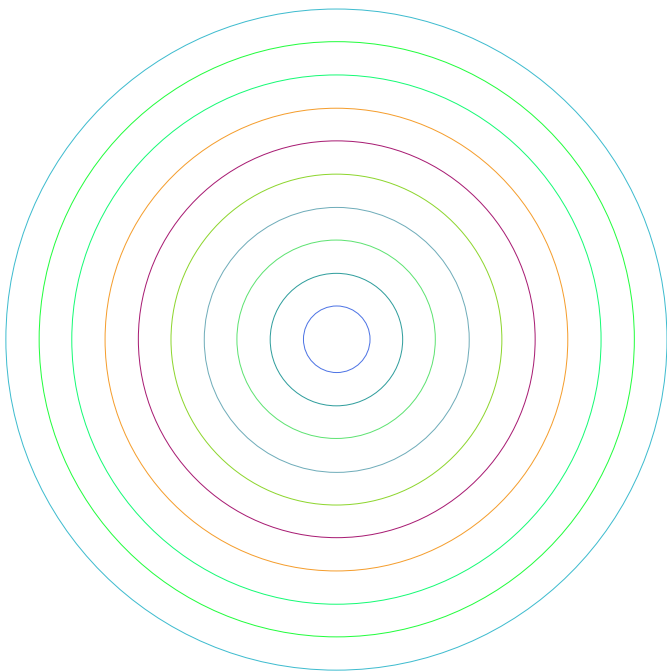
### Section 14 Problems

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In[51]:= (*14.1 5 concentric circles centered at {0,0} with radii 1,2,...,5. *)
Graphics[Table[Circle[{0, 0}, r], {r, 5}]]
(*14.2 10 concentric circles with random colors*)
Graphics[Table[Style[Circle[{0, 0}, r], RandomColor[]], {r, 10}]]
(*14.3 Graphics of a 10x10 grid of circles
with radius 1 centered at integer points {x,y}*)
Graphics[Table[Circle[{x, y}, 1], {x, 10}, {y, 10}]]
(*14.4 A 10x10 grid of points with coordinates at integer positions up to 10*)
Graphics[Table[Point[{x, y}], {x, 10}, {y, 10}]]
(*14.5 A Manipulate with between 1 and 20 concentric circles*)
Manipulate[Graphics[Table[Circle[{0, 0}, r], {r, 1, n}]], {n, 20, 1}]
(*14.6 Place 50 spheres with random
colors at random integer coordinates up to 10*)
Graphics3D[Table[Style[Sphere[RandomInteger[10, 3]], RandomColor[]], 50]]
(*14.7 An 11x11x11 array of spheres with RGB components ranging
from 0 to 1. The spheres should be centered at integer coordinates,
and should just touch each other*)
Graphics3D[Table[{RGBColor[x/10, y/10, z/10], Sphere[{x, y, z}, 1/2]},
{x, 11}, {y, 11}, {z, 11}, {h, 0, 1.1, .1}]]
(*Doing it to  $\frac{1}{2}$  makes the sphere barely touch, but I'm not sure why....*)
(*14.8 A Manipulate with t varying between -2 and +2 that contains
circles of radius x centered at {t*x,0} with x going from 1 to 10*)
Manipulate[Graphics[Table[Circle[{t*x, 0}, x], {x, 1, 10}]], {t, -2, 2}]
(*14.9 A 5x5 array of regular hexagons with size 1/2,
centered at integer points*)
Graphics[Table[RegularPolygon[{x, y}, 1/2, 6], {x, 5}, {y, 5}]]
(*14.10 A line in 3D that goes through 50 random
points with integer coordinates randomly chosen up to 50*)
Graphics3D[Line[Table[RandomInteger[50, 3], 50]]]
(*14.11 Manipulate of an icosahedron with side length
varying from 1 to 2 and a dodecahedron with side length 1,
both having opacity 0.5 and the same center *)
Manipulate[Graphics3D[{Style[Dodecahedron[{1, 1, 1}, 1], Opacity[.5]],
Style[Icosahedron[{1, 1, 1}, n], Opacity[.5]]}], {n, 1, 2, .1}]
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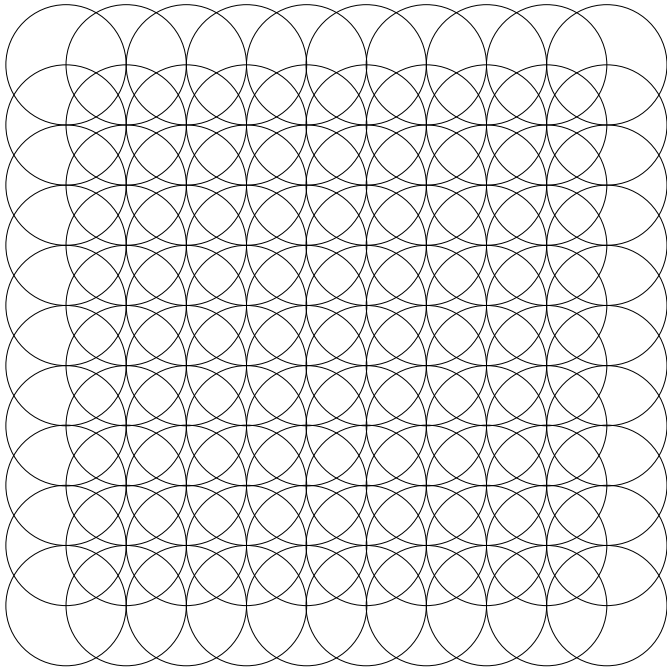
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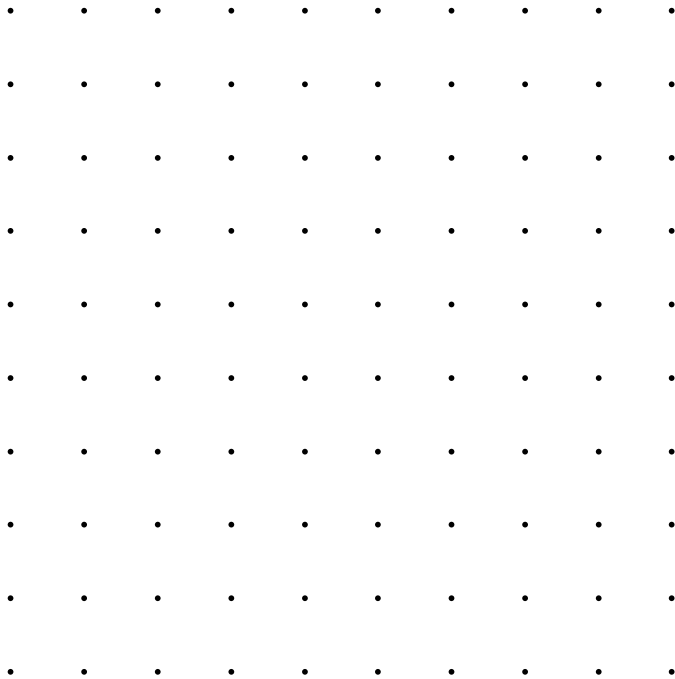
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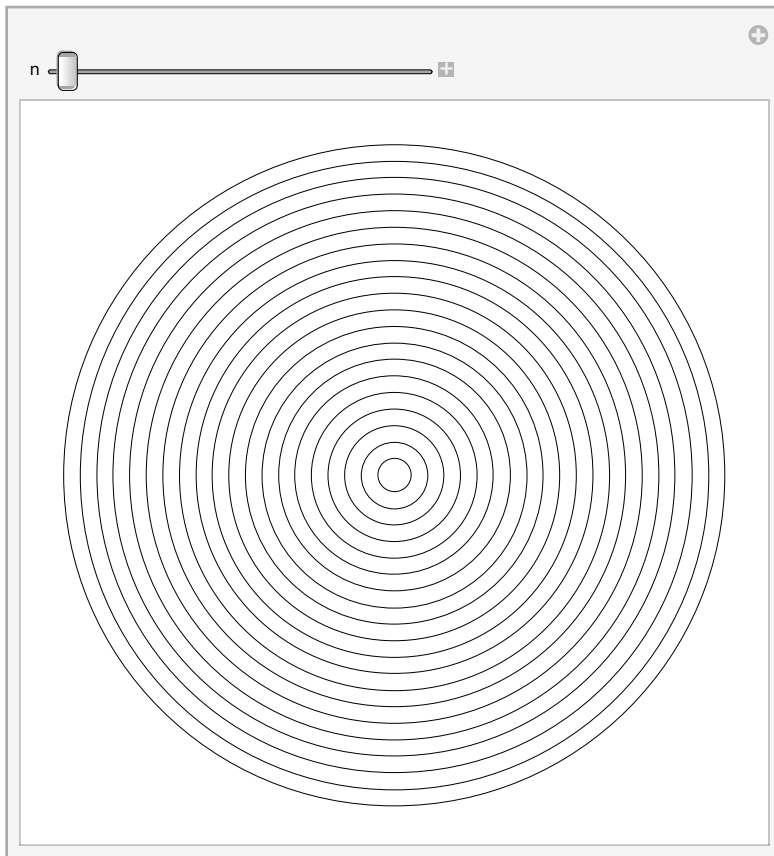
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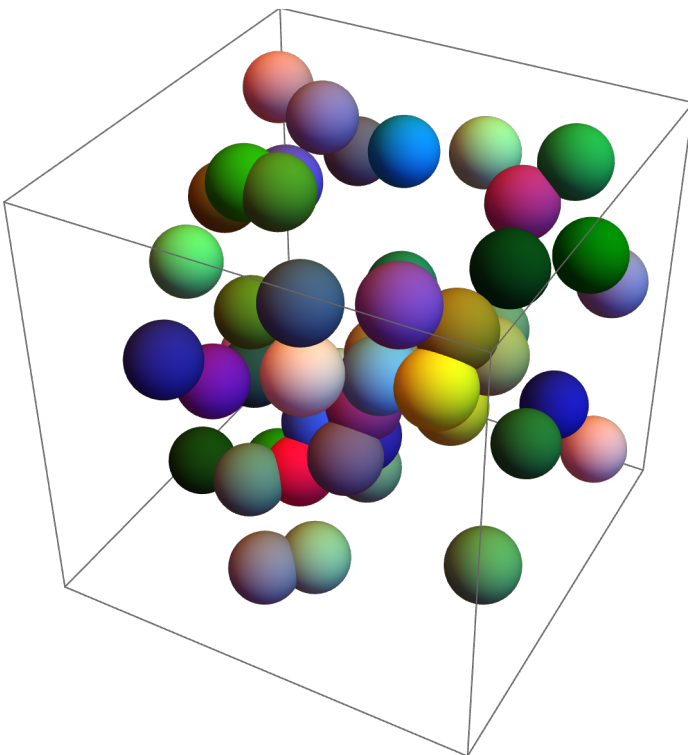
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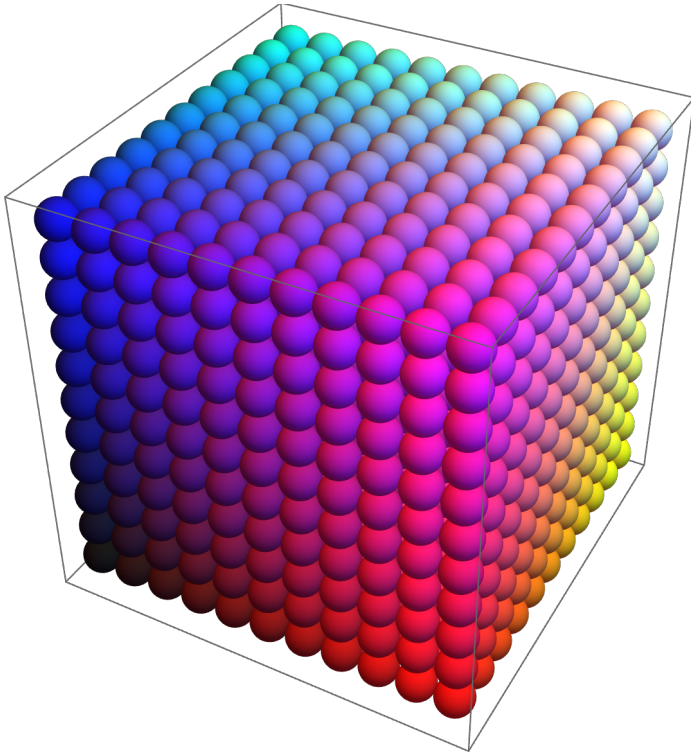
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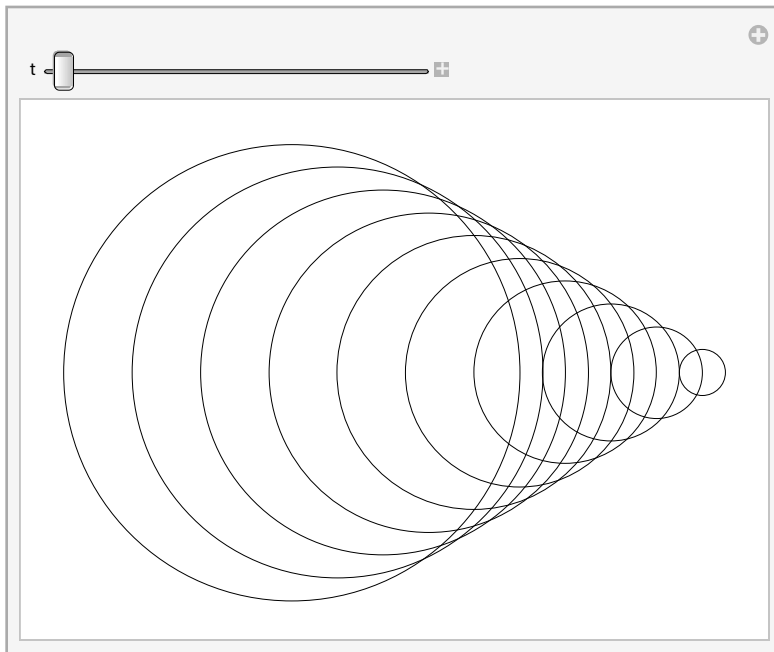
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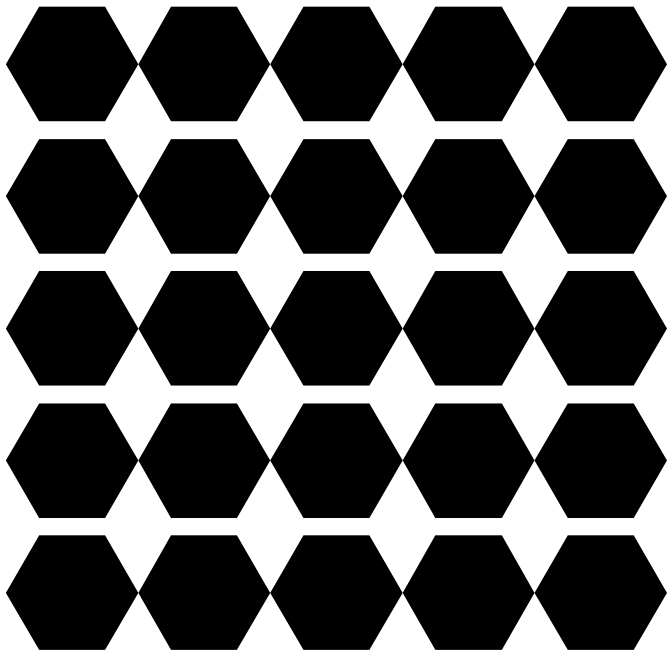
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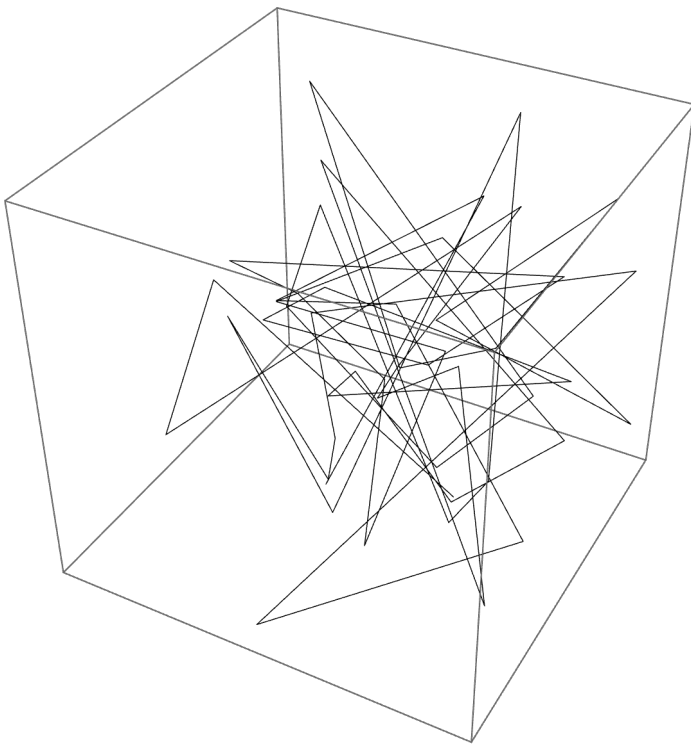
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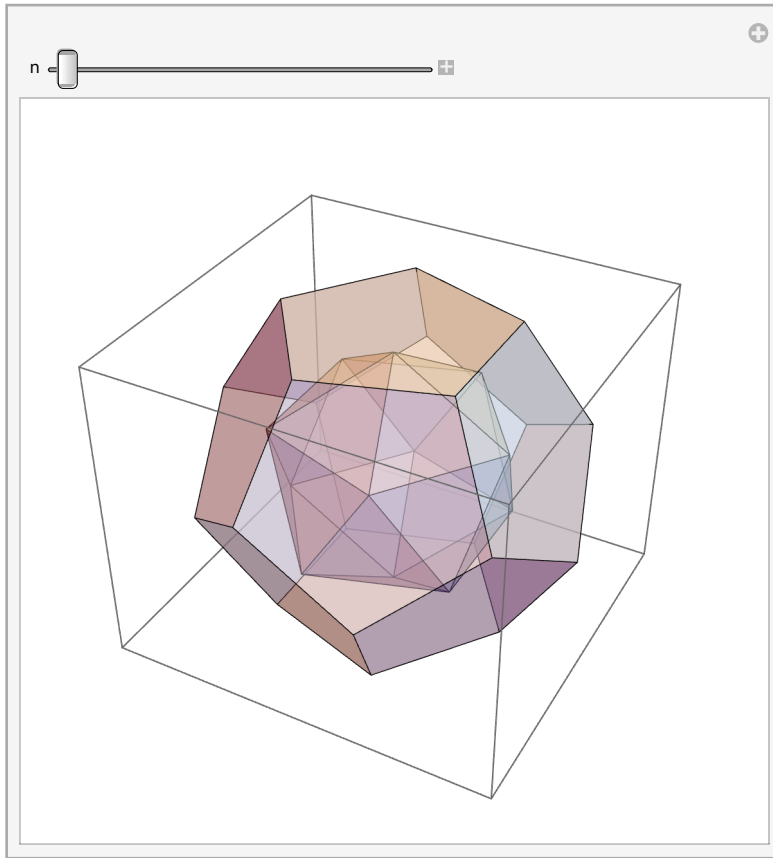
Out[59]=



Out[60]=



Out[61]=



Section 17 Problems

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(*17.1 4.5 lbs (pounds) to kilograms*)
UnitConvert[4.5 lb, "kilograms"]

(*17.2 60.25 mph to kilometers per hour*)
UnitConvert[60.25 mi/h, km/h ]

(*17.3 The height of the Eiffel Tower in miles*)
UnitConvert[Eiffel Tower BUILDING ["Height"], "Miles"]

(*17.4 The height of Mount Everest divided by the height of the Eiffel Tower *)
Mount Everest MOUNTAIN ["Elevation"]
Eiffel Tower BUILDING ["Height"]

(*17.5 The mass of the Earth divided by the mass of the Moon*)
Earth PLANET ["Mass"]
Moon PLANETARY MOON ["Mass"]

(*17.6 2500 Japanese yen to US dollars*)
CurrencyConvert[¥2500., $ ]

(*17.7 The total of 35 ounces, 1/4 ton, 45 lbs and 9 stone in kilograms*)
UnitConvert[35 oz + 0.25 sh tn + 45 lb + 9 stone, "Kilograms"]

(*17.8 Planets distance in light years*)
UnitConvert[EntityClass["Planet", {average radius → TakeLargest[5]}][
distance from Earth ], "LightYears"]

(*17.9 Rotate the string "hello" by 180 degrees*)
Rotate["hello", 180 °]

(*17.10 A table of a size-100 "A" rotated by 0° through 360° in steps of 30°*)
Table[Style[Rotate["A", x ° ], 100], {x, 0, 360, 30}]

(*17.11 Manipulate to rotate an image of a cat between 0° and 180°*)
Manipulate[Rotate[domestic cat SPECIES SPECIFICATION ... ✓ ["Image"], x ° ], {x, 0, 180, 10}]

(*17.12 Generate graphics for a path obtained by turning 0°, 1°, 2°, ..., 180°*)
Graphics[Line[AnglePath[Table[n ° , {n, 0, 180, 1}]]]]

(*17.13 Graphics of the path obtained by turning a constant angle 100 times,
controlling the angle from 0° to 360° with a Manipulate*)
Manipulate[Graphics[Line[AnglePath[Table[n Degree, 100]]]], {n, 0, 360}]

(*17.14 Graphics of the path obtained by successively
turning by the digits of 2^10000 multiplied by 30 degrees *)
Graphics[Line[AnglePath[IntegerDigits[2^10 000] * 30 Degree]]]

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Out[62]=

2.04117 kg



Out[63]=

96.963 km/h

Out[64]=

0.205052 mi

Out[65]=

26.8147

Out[66]=

81.3

Out[67]=

\$16.44

Out[68]=

305.353 kg

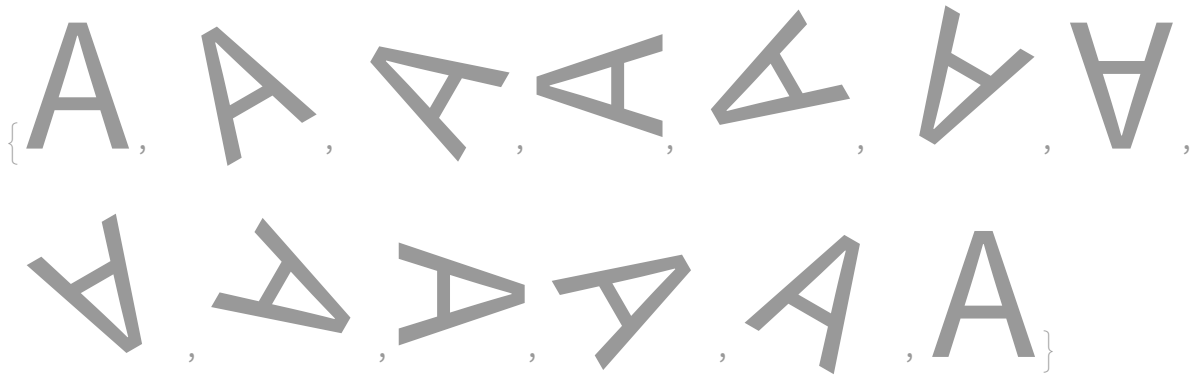
Out[69]=

{0.0000746015 ly, 0.000166137 ly, 0.00030893 ly, 0.000485532 ly, 0. ly}

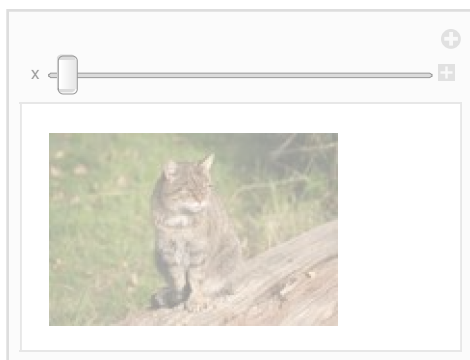
Out[70]=

011əɥ

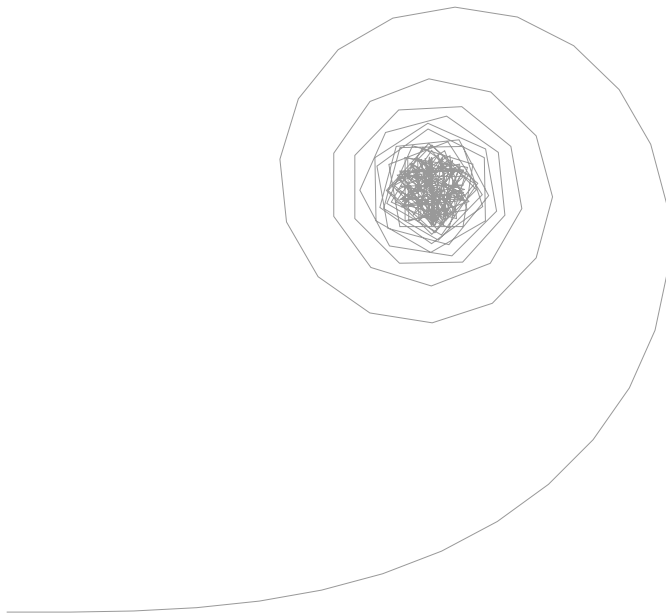
Out[71]=



Out[72]=



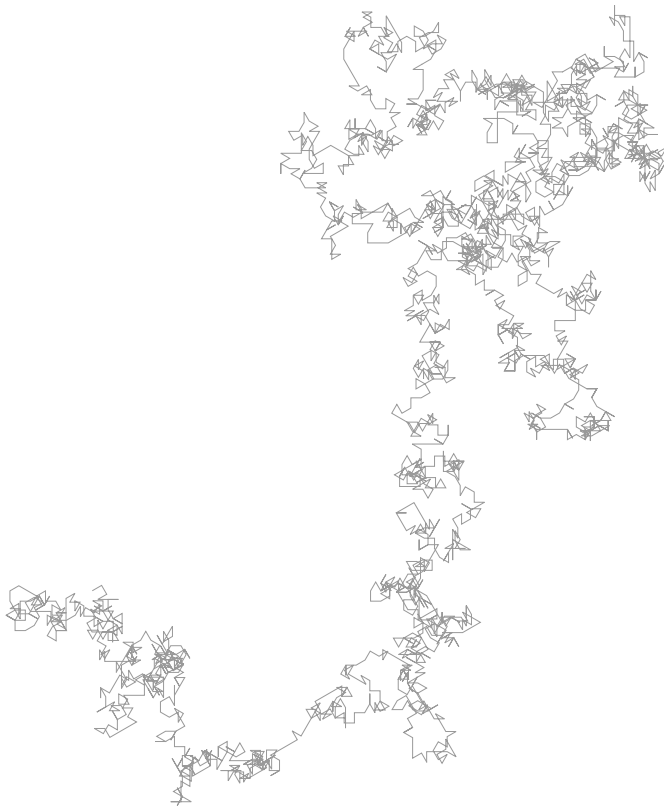
Out[73]=



Out[74]=



Out[75]=



In[76]:=