

PS 17 — Rania 4.8.2025

Section 39

= vs. := (delayed)

x-> vs. x :>

```
In[68]:= (*39.1 Replace x in {x,x+1,x+2,x^2} by the same random integer up to 100. *)
{x, x + 1, x + 2, x^2} /. x -> RandomInteger[100]
```

```
Out[68]:=
{43, 44, 45, 1849}
```

```
In[69]:= (*39.2 Replace each x in {x,x+1,x+2,x^2}
by a separately chosen random integer up to 100.*)
```

```
In[70]:= {x, x + 1, x + 2, x^2} /. x :> RandomInteger[100]
```

```
Out[70]:=
{42, 34, 93, 64}
```

Section 40

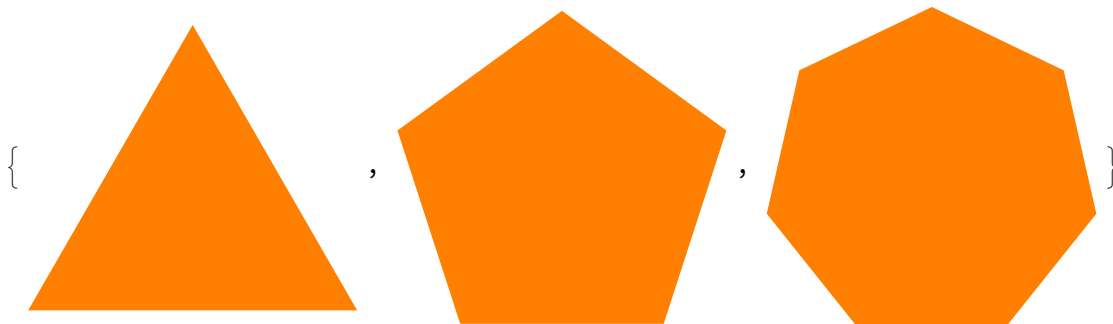
```
In[71]:= (*40.1 Define a function f that computes the square of its argument*)
```

```
In[72]:= f[x_] := x * x
{f[2], f[4], f[6]}
```

```
Out[73]:=
{4, 16, 36}
```

```
In[74]:= (*40.2 Define a function poly that takes an integer,
and makes a picture of an orange regular polygon with that number of sides*)
poly[n_] := Graphics[Style[RegularPolygon[n], Orange]]
{poly[3], poly[5], poly[7]}
```

```
Out[75]=
```



```
In[76]:= (*40.3 Define a function f that takes a list
of two elements and puts them in reverse order*)
f[{x_, y_}] := {y, x}
f[{1, 2}]
```

```
Out[77]=
{2, 1}
```

```
In[78]:= (*40.4 Create a function f that takes two arguments and gives
the result of multiplying them and dividing by their sum.*)
f[{x_, y_}] :=  $\frac{x*y}{x+y}$ 
f[{4, 5}]
```

```
Out[79]=
 $\frac{20}{9}$ 
```

```
In[80]:= (*40.5 Define a function f that takes a list of two
elements and returns a list of their sum,difference and ratio *)
f[{x_, y_}] := {x+y, x-y,  $\frac{x}{y}$ }
f[{3, 4}]
```

```
Out[81]=
{7, -1,  $\frac{3}{4}$ }
```

```
In[82]:= (*40.6 Define a function evenodd that gives Black if its argument
is even and White otherwise,but gives Red if its argument is 0 *)
evenodd[x_] := If[x == 0, Red, If[EvenQ[x] == True, Black, White]]
{evenodd[0], evenodd[1], evenodd[2]} (*lol the egyptian flag colors*)
```

```
Out[83]=
{ ,  ,  }
```

```
In[84]:= (*40.7 Define a function f of three arguments where
the second two arguments are added if the first argument is 1,
multiplied if it's 2 and raised to a power if it's 3*)
f[{x_, y_, z_}] :=
If[x == 1, y + z, If[x == 2, y * z, If[x == 3, y^z, "First Argument is not 1, 2, 3"]]]
{f[{1, 2, 3}], f[{2, 2, 3}], f[{3, 2, 3}]}
```

```
Out[85]=
{5, 6, 8}
```

```
In[86]:= (*40.8 Define a Fibonacci function f with f[0] and f[1] both being 1,
and f[n] for integer n being the sum of f[n-1] and f[n-2]*)
f[x_] := If[x != 0 && x != 1, f[x-1] + f[x-2], 1]
f /@ Range[5]
```

```
Out[87]=
{1, 2, 3, 5, 8}
```

```
In[88]:= (*40.9 Create a function animal that takes a string,
and gives a picture of an animal with that name.*)
animal[x_] := Interpreter["Animal"][x][image]
animal[#] & /@ {"horse", "cat", "camel"}
```

Out[89]=



```
In[90]:= (*40.10 Define a function nearwords that takes a string and an integer n,
and gives the n words in WordList[] that are nearest to a given string.*)
```

```
In[91]:= nearwords[x_, n_] := Nearest[WordList[], x, n + 1]
nearwords["hello", 2]
nearwords["brian", 9]
nearwords["waves", 22]
```

Out[92]=

```
{hello, cello}
```

Out[93]=

```
{bran, aria, avian, bairn, ban, barman, bean, bias, bin}
```

Out[94]=

```
{eaves, wages, wave, waver, aver, cave, elves, fives, gavel, have, haven,
heaves, hives, lave, mates, maven, names, nave, navel, pave, paved, rates}
```