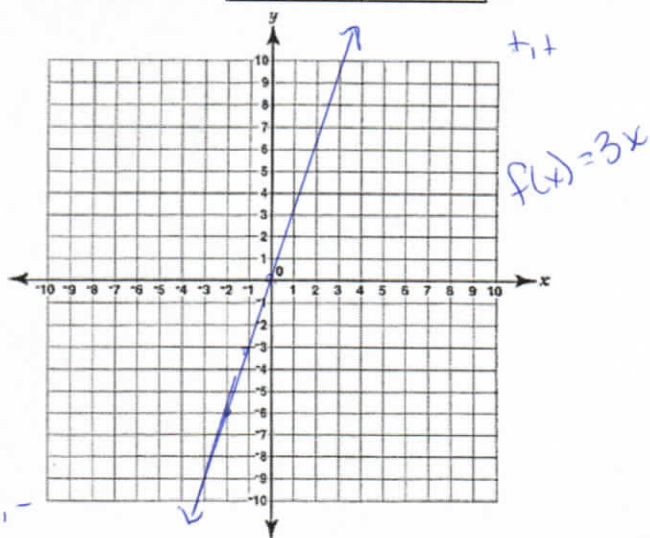


For each function below, complete the *input-output* table using the domain of $\{-2, -1, 0, 1, 2, 3\}$. Plot the points for each function, connecting the dots (creating a *continuous* function).

$f(x) = 3x$

Input	Output
-2	-6
-1	-3
0	0
1	3
2	6
3	9

} 3
} 3
} 3
} 3
} 3
} 3
add 3

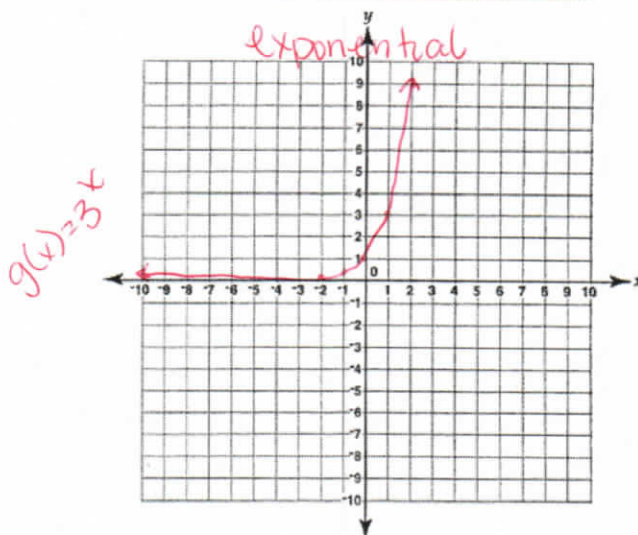


$f(x) = 3^x$

Input	Output
-2	1/9
-1	1/3
0	1
1	3
2	9
3	27

3^{-2}
 3^{-1}
 3^2
 3^3

} 27
} 23
} 2
} 6
} 18
multiply by 3



What is the domain? all real numbers

What is the range? all real numbers

Linear or non-linear? Linear

What is the domain? all real numbers

What is the range? $y > 0$, all positive reals

Linear or nonlinear? Nonlinear

Now you will find the difference between *successive* (one after another) y-coordinates in each table.

$f(x) = 3x$

Input	Output

$f(x) = 3^x$

Input	Output

What do you notice about the successive differences of $f(x) = 3x$ and $f(x) = 3^x$?

Exponential Function

$$y = a \cdot b^x$$

Initial Condition
Starting value
y-intercept

x ← Independent variable
is ALWAYS the exponent

base
growth factor
multiplicative pattern
 $b \neq 1$ $b > 0$

6.4 P.289: 1,

6-16 even, 18-21 all,

26, 36, 38