1.

```
A=[1,2,3,4,5,6,7,8,9,10,11]

B=len(A)

C=0

while(C<B):

        if(A[C]%2==0):
                A[C]=A[C]**2

        C=C+1

print(A)
```

Output: [1, 4, 3, 16, 5, 36, 7, 64, 9, 100, 11]

```
[5]: A=[1,2,3,4,5,6,7,8,9,10,11]
     B=len(A)
     C=0
     while(C<B):
         if(A[C]%2==0):
             A[C]=A[C]**2
         C=C+1
     print(A)

     [1, 4, 3, 16, 5, 36, 7, 64, 9, 100, 11]
```

2.

```
A= [1,2,3,4,5,6,7,8,9,10,11]

B= [C**2 if C%2==0 else C for C in A]

print(B)
```

output: [1, 4, 3, 16, 5, 36, 7, 64, 9, 100, 11]

```
[15]: A=[1,2,3,4,5,6,7,8,9,10,11]
      B=[C**2 if C%2==0 else C for C in A]
      print(B)

      [1, 4, 3, 16, 5, 36, 7, 64, 9, 100, 11]
```

-

③ Is the given equation a function? why?

ⓐ $y = \begin{cases} ax+b & \text{if } x \geq 0 \\ b & \text{if } x < 0 \end{cases}$

Case: 1 $\quad \cdot\ y = ax+b \quad x \geq 0$

In the given equation $y=ax+b$ where $x \geq 0$ for the equation to be a function There should be only one distinct value of y for any value of x

$y = ax+b$

let consider x values are greater than equal $=0$

$x=1, \quad y=a+b$

$x=2 \quad y=2a+b$

We are getting different value of y for any value of x, so, $y=ax+b$ is a function

Case: 2 If the x less than 0 $\ x<0$

$y=b$ is a linear equation

The function relates each input to exactly one output In this case for each value of x there is a unique value of y

$$y = \begin{cases} ax+b & \text{if } x \geq 0 \\ b & \text{if } < 0 \end{cases}$$ is a function

(b) $y^2 = ax^2+b \quad a>b>0$

$y = \sqrt{ax^2+b}$

$y = +\sqrt{ax^2+b}$ or $-\sqrt{ax^2+b}$

Since the equation $y = \sqrt{ax^2+b}$ has two possible solutions for y, both positive and negative square roots of (ax^2+b), for any given x, it fails to meet the essential criteria for a function, thus making it not avalid function

$y^2 = ax^2+b$ is not a function

(4) Given $f(x) = (9-x)/x$, $g(x)$ is the reflection of the function $f(x)$ about $y=x$

(a) find $g(x)$

The reflection of the function $f(x)$ we need swap x and y in the $f(x)$ function

$$x = \frac{(9-x)}{x}$$

$$x = \frac{(9-y)}{y}$$

$$xy = 9-y$$

$$y + xy = 9$$

$$y(1+x) = 9$$

$$y = \frac{9}{(1+x)}$$

when $y=x$ is

$$\boxed{g(x) = \frac{9}{1+x}}$$

(b) verify if $g(f(x)) = x$

sol: given $g(x) = 9/(x+1)$ and $f(x) = (9-x)/x$

$$g(f(x)) = g\left(\frac{9-x}{x}\right)$$

$$g(f(x)) = \frac{9}{\frac{9-x}{x}+1}$$

$$g(f(x)) = \frac{9}{\frac{9-\cancel{x}+\cancel{x}}{x}}$$

$$g(f(x)) = \frac{9}{9/x}$$

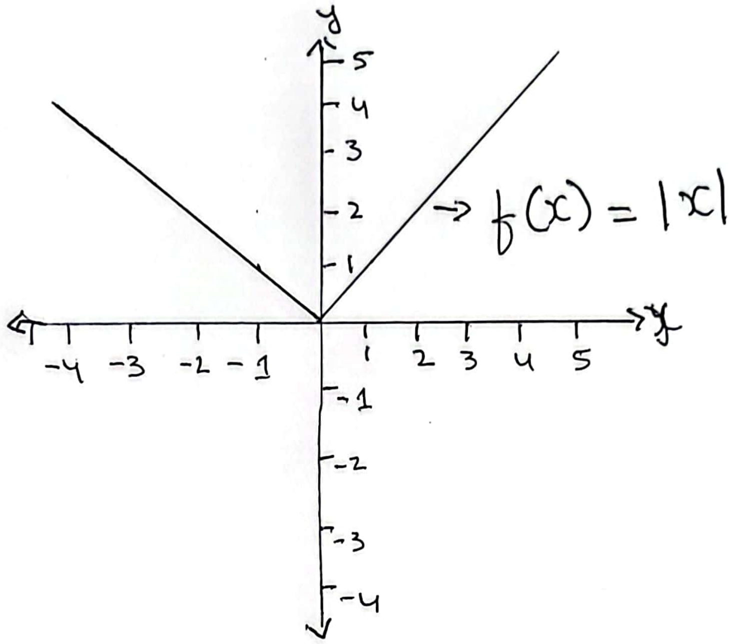
$$g(f(x)) = \frac{9x}{9}$$

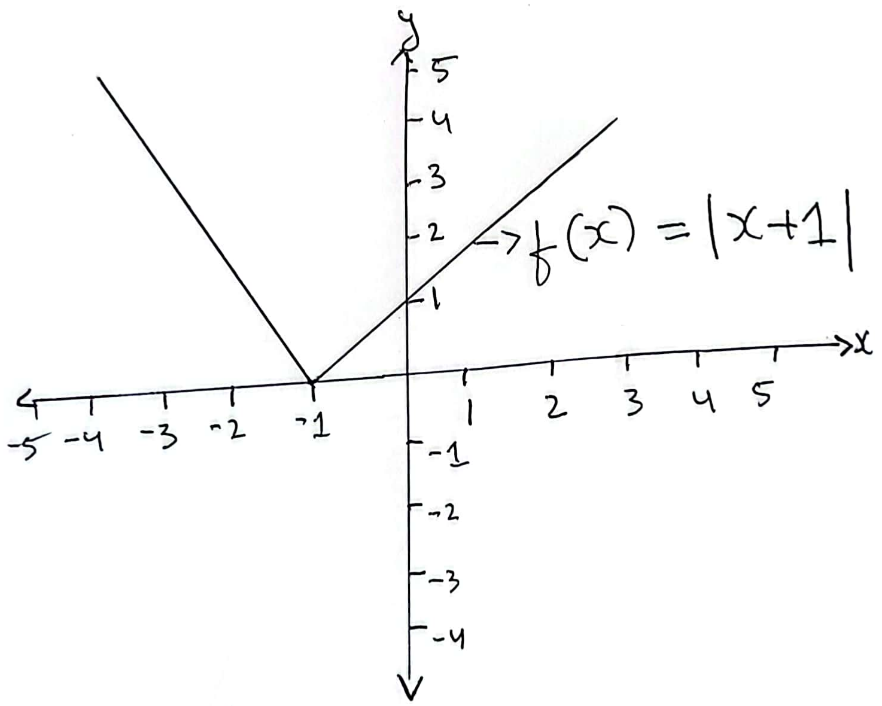
$$\boxed{g(f(x)) = x}$$

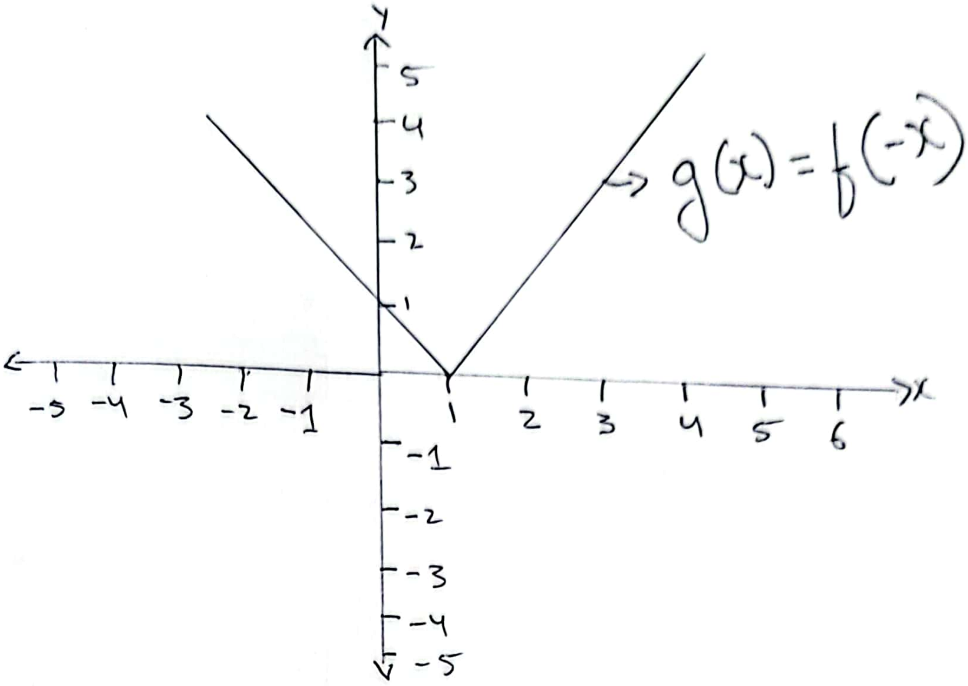
hence proved verified

(5) use transformations to sketch the graph of the following functions

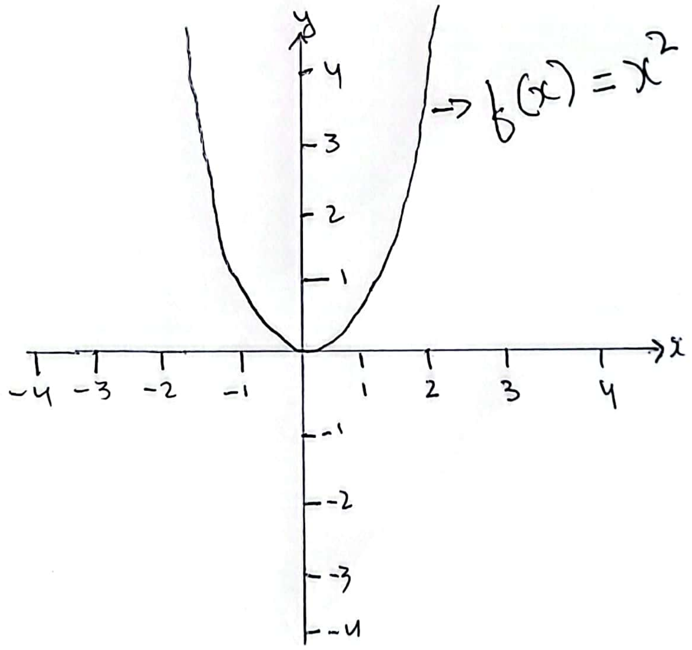
(a) $f(x) = |x+1|$ $\quad$ $g(x) = f(-x)$



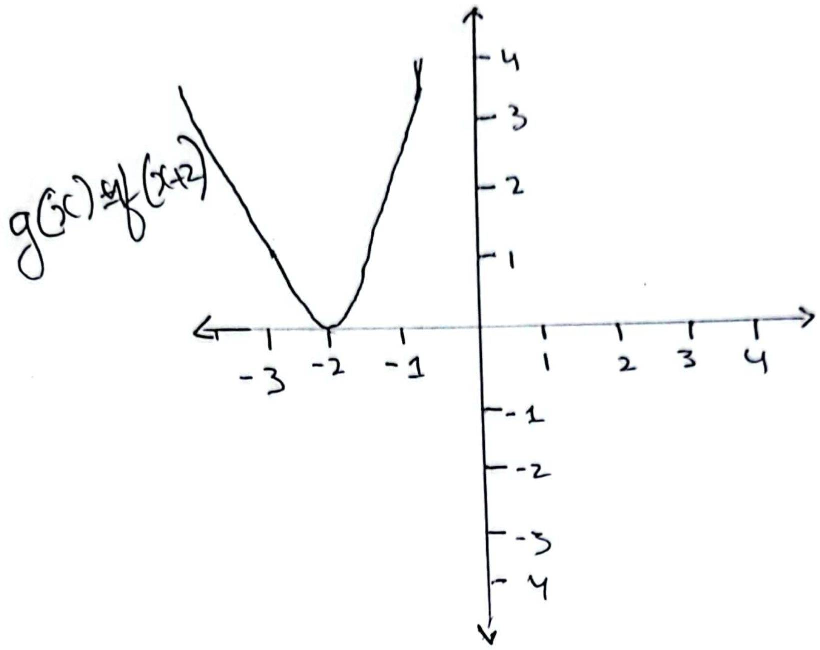




(b) $f(x) = x^2$ $\quad$ $g(x) = 4f(x+2)$



$g(x) = 4f(x+2)$



f(x) is translated by 2 units to right and strecthed by 4 units

⑥ Find transformations functions

ⓐ The graph of $f(x) = [(x-1)^2 - 1]$ is flipped about the y axis and then stretched by 2 in the y direction find the equation of the new graph of $g(x)$

sol: When we flip a graph about the y-axis we need replace the x with $-x$

$$f(x) = [(x-1)^2 - 1]$$

~~we~~ replacing x with $-x$

$$f(-x) = [(-x-1)^2 - 1]$$

The graph stretched by 2 in the y direction so we need to multiply the expression by 2

substitute the equation of $f(-x)$ into $g(x)$

$$g(x) = 2 * f(-x)$$

$$g(x) = 2 * [(-x-1)^2 - 1]$$

$$= 2 * [(x+1)^2 - 1]$$

$$= 2 * [x^2 + 2x + 1 - 1]$$

$$= 2 * [x^2 + 2x$$

$$\boxed{g(x) = 2x^2 + 4x}$$

The equation of the new graph $g(x) = 2x^2 + 4x$

(6)

(6) The graph of $f(x) = x^2$ is flipped about the x-axis and then translated by 2 unit to the right and 9 units up. find the equation of the new graph of $g(x)$

sol: we flip a graph about the x-axis, we replace $f(x)$ with $-f(x)$ in the equation

$$-f(x) = -x^2$$

To translated by 2 unit to the righ, then we need replace x with $(x-2)$ To translate 9 units up, so we need to add 9 to the equation

The equation of the new graph $g(x) = -f(x-2)+9$

$$g(x) = -f(x-2)+9$$
$$= -(x-2)^2+9$$
$$g(x) = -(x-2)^2+9 \quad \because \text{apply } (a-b)^2 \text{ formula}$$
$$g(x) = -(x^2-4x+4)+9$$
$$g(x) = -x^2+4x-4+9$$
$$g(x) = -x^2+4x+5$$

The equation of the new graph $g(x) = -x^2+4x+5$