1.

$1-g(x)$

(-2,4)

(-4,1)

(0,1)

Domain $[-4,0]$
Range $[1,4]$
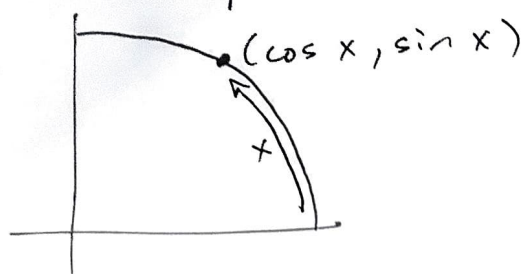
(Flip across x-axis and
raise by 1)

$g(x-2)$
(shift right 2)
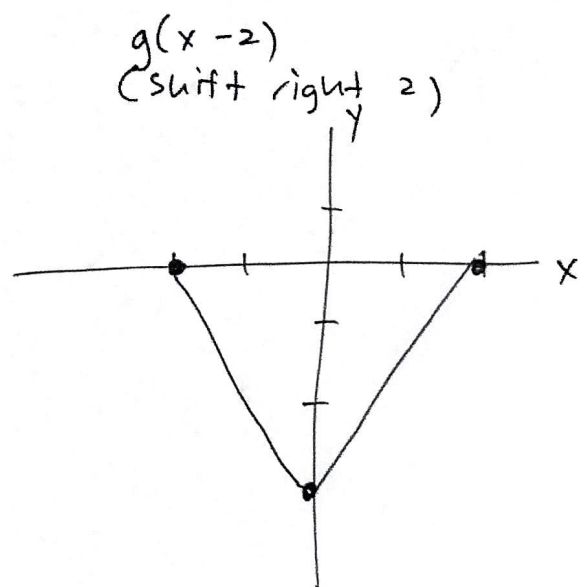
Domain $[-2,2]$
Range $[-5,0]$.

2. $(x+1)^2(x+2)^3 + (x+1)^3(x+2)^2$

$= (x+1)^2(x+2)^2(x+2) + (x+1)^2(x+2)^2(x+1)$

$= (x+1)^2(x+2)^2(x+2+x+1)$

$= (x+1)^2(x+2)^2(2x+3).$

(Best)

3. If you travel around a unit circle counterclockwise, starting at $(1,0)$ and going a distance of x, then $\cos(x)$ and $\sin(x)$ are the x- and y-coordinates of the point you arrive at.
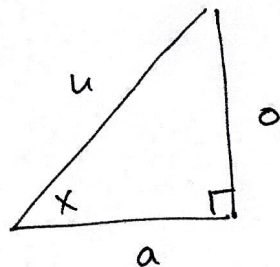

$(\cos x, \sin x)$

x

Then
$\tan(x) = \dfrac{\sin(x)}{\cos(x)}$

$\sec(x) = \dfrac{1}{\cos(x)}.$

3. (Alternative answer; also good)

Draw a right triangle with angle x as shown and label the sides a, o, and h.

Then

$$\sin(x) = \frac{o}{h}, \quad \cos(x) = \frac{a}{h},$$

$$\tan(x) = \frac{o}{a}, \quad \sec(x) = \frac{h}{a},$$

4.

$y = 2^{-x} - 1$

(flip across y-axis)

$y = 2^{x} - 1$

$(-2, 3)$ $(2, 3)$

$(-1, 1)$ $(1, 1)$

$(0, 0)$

$(-1, -\frac{1}{2})$