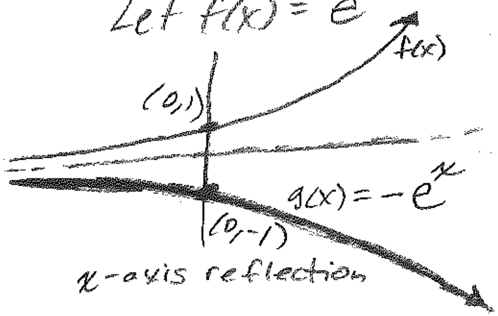
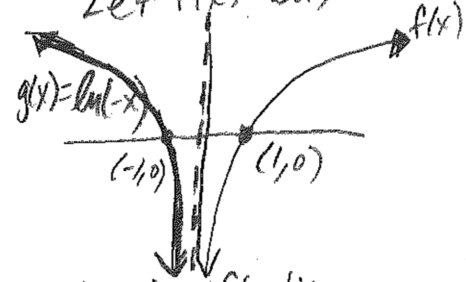
(1) $g(x) = -f(x)$
Let $f(x) = e^x$



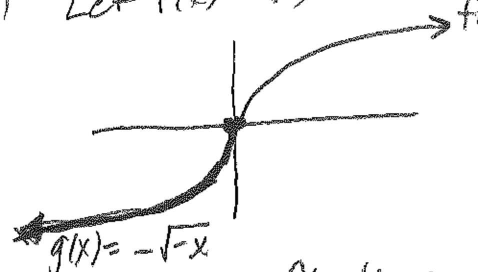
x-axis reflection

(2) $g(x) = f(-x)$
Let $f(x) = \ln x$



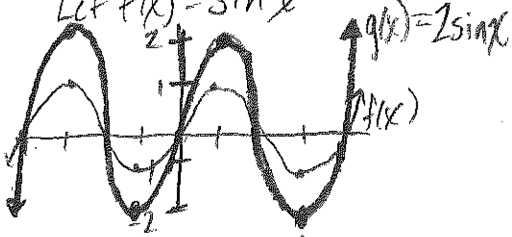
y-axis reflection

(3) $g(x) = -f(-x)$
Let $f(x) = \sqrt{x}$



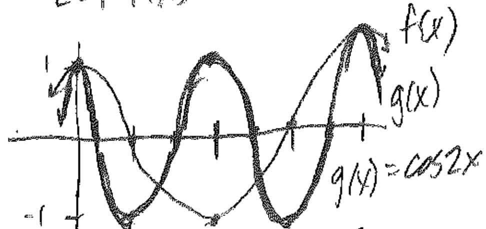
x & y axis reflections

(4) $g(x) = 2f(x)$
Let $f(x) = \sin x$



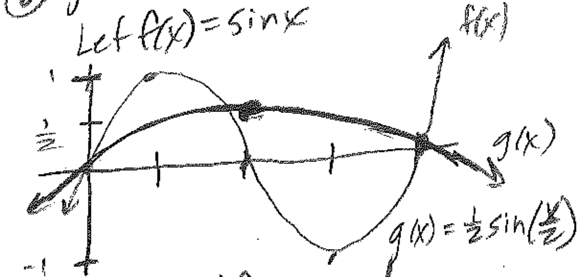
vertical stretch bfo 2

(5) $g(x) = f(2x)$
Let $f(x) = \cos x$



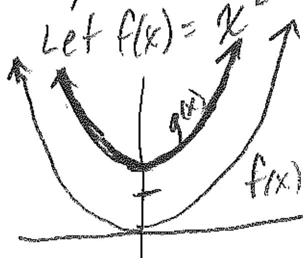
Horizontal compression bfo 2

(6) $g(x) = \frac{1}{2} f(2x)$
Let $f(x) = \sin x$



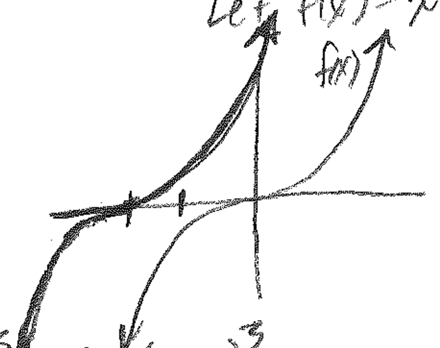
vert. comp. bfo 2 and
Horz comp bfo 2

(7) $g(x) = f(x) + 2$
Let $f(x) = x^2$



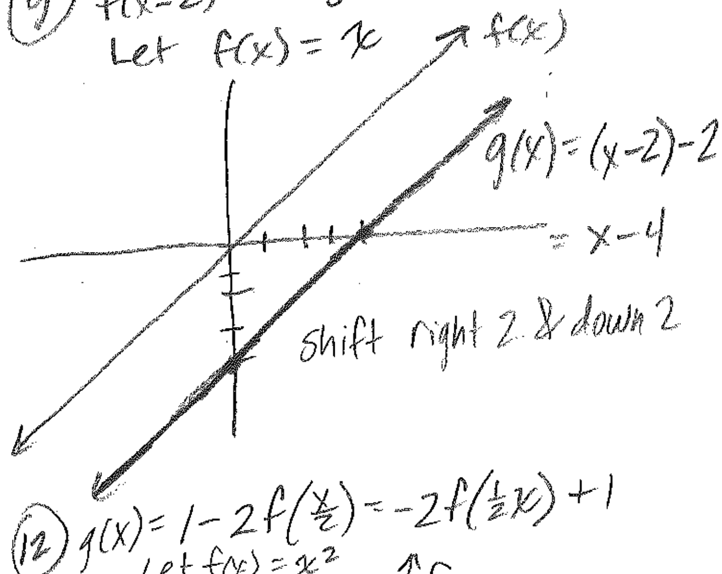
$g(x) = x^2 + 2$
shift up 2 units

(8) $g(x) = f(x+2)$
Let $f(x) = x^3$



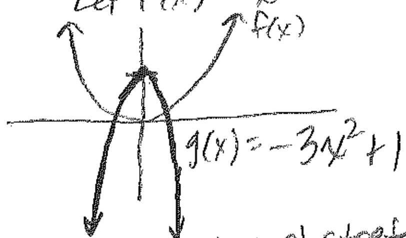
$g(x) = (x+2)^3$
shift left 2 units

(9) $f(x-2) - 2 = g(x)$
Let $f(x) = x$



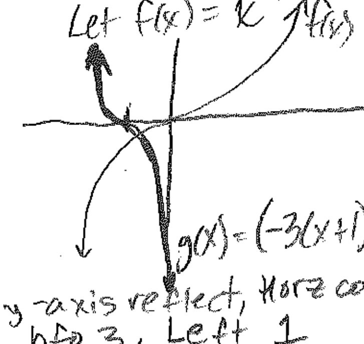
shift right 2 & down 2

(10) $g(x) = -3f(x) + 1$
Let $f(x) = x^2$



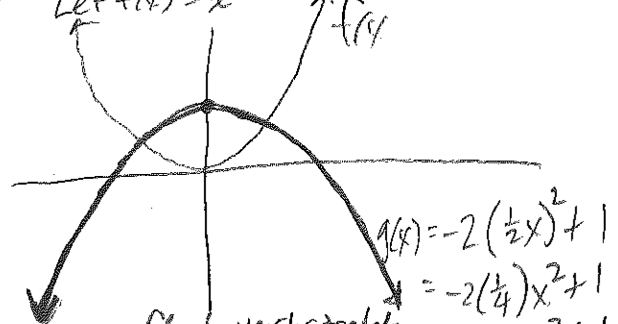
x-axis reflect, vert stretch
bfo, up 1

(11) $g(x) = f(-3x - 3)$
$g(x) = f(-3(x+1))$
Let $f(x) = x^3$



y-axis reflect, Horz comp
bfo 3, Left 1

(12) $g(x) = 1 - 2f(\frac{x}{2}) = -2f(\frac{1}{2}x) + 1$
Let $f(x) = x^2$

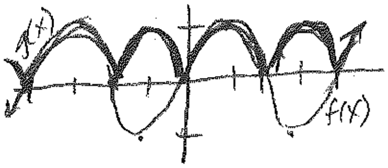


$g(x) = -2(\frac{1}{2}x)^2 + 1$
$= -2(\frac{1}{4})x^2 + 1$
$= -\frac{1}{2}x^2 + 1$

x-axis reflect, vert stretch
bfo 2, Horz stretch bfo 2,
up 1

(13) $g(x)=|f(x)|$

Let $f(x)=\sin x$

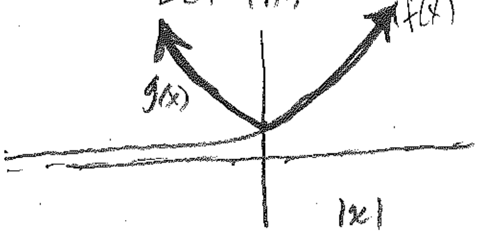


$g(x)=|\sin x|$

All pos y-values remain, neg y-values reflect across x-axis.

(14) $g(x)=f(|x|)$

Let $f(x)=e^x$

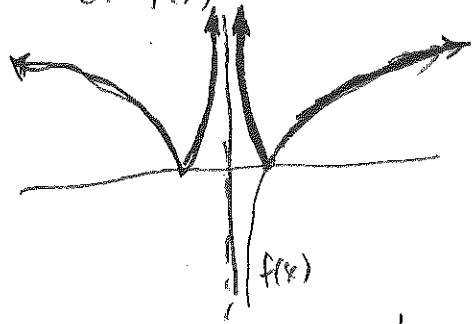


$g(x)=e^{|x|}$

All pos x-values remain, neg x-values are replaced by reflecting pos x-values across y-axis

(15) $g(x)=|f(|x|)|$

Let $f(x)=\ln x$

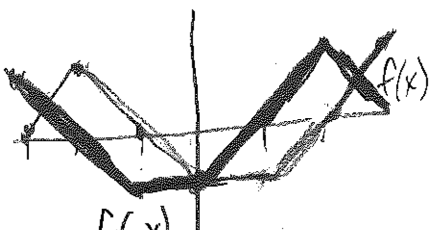


$g(x)=|\ln|x||$

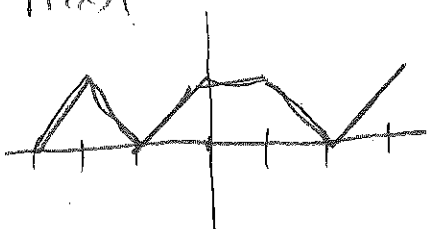
*Apply tranformations from #13 & #14 consecutively in any order

No numbered trial

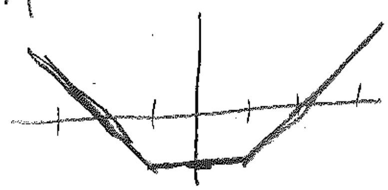
$f(-x)$



$|f(x)|$



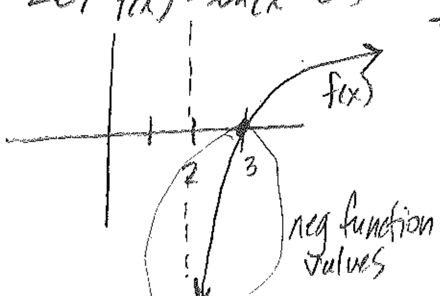
$f|x|$



*we don't need the equation of the function to show how the

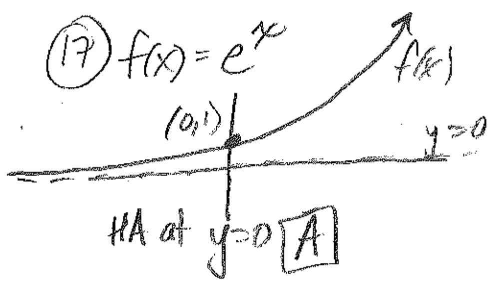
(16) $\ln(x-2)<0$
right 2

Let $f(x)=\ln(x-2)$



$f(x)<0$ for $2<x<3$ $\boxed{C}$

(17) $f(x)=e^x$



HA at $y=0$ $\boxed{A}$

(18) $f(x)=0$ at $x=-1$ & 2

$f(\frac{x}{2})=f(\frac{1}{2}x)$

Horizontal stretch bf of 2

So roots are doubled and are $x=-2$ an $x=4$

$\boxed{E}$

(19) $f(x_1)+f(x_2)=f(x_1+x_2)$

$\boxed{B}$ since

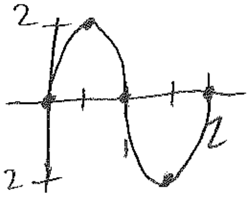
$f(x_1)+f(x_2)$

$=2(x_1)+2(x_2)$

$=2(x_1+x_2)$

$=f(x_1+x_2)$

(20)



Period $= 2 = \frac{2\pi}{B}$

So $B = \pi$, $A = 2$

Sine, $C = 0$, $D = 0$

$f(x) = A\sin(B(x-C)) + D$

So $f(x) = 2\sin \pi x$ $\boxed{C}$

(21) $y = \sin(\frac{1}{2}x)$, $B = \frac{1}{2}$

Period $= P = \frac{2\pi}{B}$

$= \frac{2\pi}{1/2} = 4\pi \neq \pi$

So $\boxed{A}$

(22) Horizontal Asymptote at $y = 1$

So $\lim_{x\to\infty} y = 1$

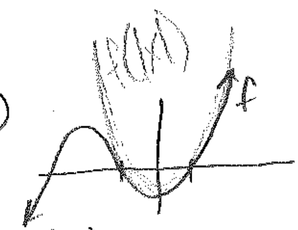
$\lim_{x\to\infty} \frac{x}{x+1} = 1$

So $\boxed{C}$

(23) $y = 2\cos(3x)$, A B

$P = \frac{2\pi}{B} = \frac{2\pi}{3}$ $\boxed{A}$

(24)



$f(|x|) \to$ leave pos x's alone, then reflect these across y-axis

$\boxed{C}$

*Note: choice D is $|f(x)|$ & choice E is $|f(|x|)|$

(25) $g(x) = A f(x-C) + D$

The graph of f is

* reflected across the x-axis, so $A < 0$
* 2 times as wide, so vertically compressed b/fo 2

So $|A| = \frac{1}{2}$

* Shifted right 3 units

So $C = 3$

* shifted down 4 units

So $D = -4$

So $g(x) = -\frac{1}{2}f(x-3) - 4$

$\boxed{E}$

(26) given $f(x)$, create $g(x)$:

(1) $g_1(x) = -f(x)$

(2) $g_2(x) = g_1(x) - 3 = -f(x) - 3$

(3) $g_3(x) = 2g_2(x) = 2(-f(x) - 3) = -2f(x) - 6$

(4) $g_4(x) = g(x) = g_3(-x) = -2f(-x) - 6$ $\boxed{C}$