Name_____ Date_____ Period_____

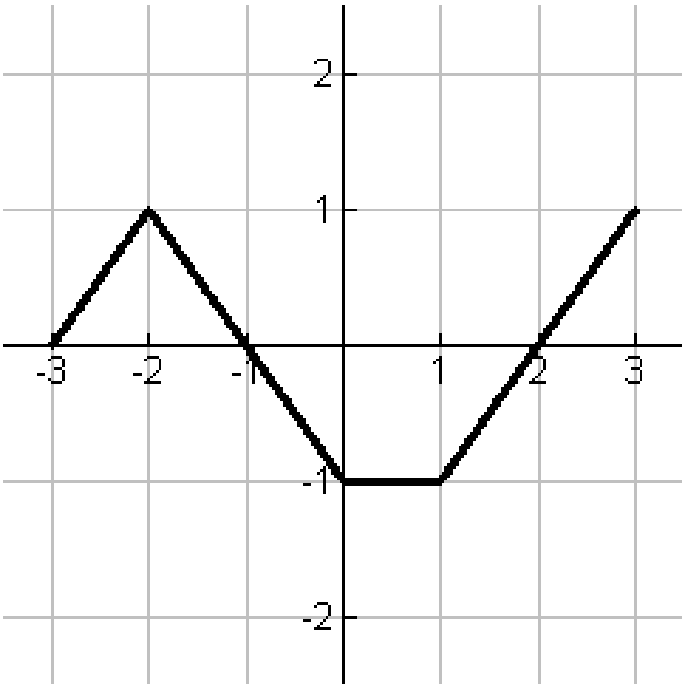
Worksheet P.2—Parent Functions & Transformations

Without a calculator, set up the equation for, then sketch the graph of each of the following functions $g(x)$ using any (or all) of the functions from the Catalog of Parent Functions. Be sure to show the important information like asymptotes, intercepts, and discontinuities. State the Domain and Range. No Calculator

1. $g(x) = -f(x)$
2. $g(x) = f(-x)$
3. $g(x) = -f(-x)$
4. $g(x) = 2f(x)$
5. $g(x) = f(2x)$
6. $g(x) = \frac{1}{2} f(2x)$
7. $g(x) = f(x) + 2$
8. $g(x) = f(x+2)$
9. $g(x) = f(x-2) - 2$
10. $g(x) = -3f(x) + 1$
11. $g(x) = f(-3x-3)$
12. $g(x) = 1 - 2f\left(\frac{x}{2}\right)$

13. $g(x) = |f(x)|$ 14. $g(x) = f(|x|)$ 15. $g(x) = |f(|x|)|$

Now try some of the same transformations on the graph of the following function.



Multiple Choice

_____ 16. $\ln(x-2) < 0$ if and only if

(A) $x < 3$ (B) $0 < x < 3$ (C) $2 < x < 3$ (D) $x > 2$ (E) $x > 3$

_____ 17. If $f(x)=e^x$, which of the following lines is an asymptote to the graph of *f*?

(A) $y=0$ (B) $x=0$ (C) $y=x$ (D) $y=-x$ (E) $y=1$

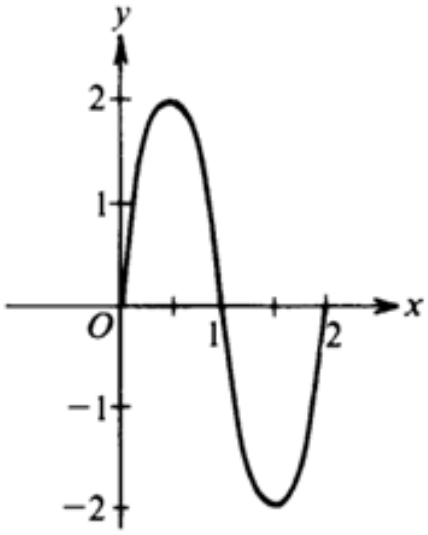
_____ 18. If the solutions of $f(x)=0$ are -1 and 2, then the solutions of $f\left(\frac{x}{2}\right)=0$ are

(A) -1 and 2 (B) $-\frac{1}{2}$ and $\frac{5}{2}$ (C) $-\frac{3}{2}$ and $\frac{3}{2}$ (D) $-\frac{1}{2}$ and 1 (E) -2 and 4

_____ 19. If $f(x_1)+f(x_2)=f(x_1+x_2)$ for all real numbers x_1 and x_2, which of the following could define *f*?

(A) $f(x)=x+1$ (B) $f(x)=2x$ (C) $f(x)=\frac{1}{x}$ (D) $f(x)=e^x$ (E) $f(x)=x^2$

_____ 20. The figure below shows the graph of a sine function for one complete period. Which of the following is an equation for the graph?



(A) $y = 2\sin\left(\frac{\pi}{2}x\right)$ (B) $y = \sin(\pi x)$ (C) $y = 2\sin(2x)$ (C) $y = 2\sin(\pi x)$ (E) $y = \sin(2x)$

_____ 21. Which of the following does NOT have a period of π?

(A) $f(x) = \sin\left(\frac{1}{2}x\right)$ (B) $f(x) = |\sin x|$ (C) $f(x) = \sin^2 x$ (D) $f(x) = \tan x$ (E) $f(x) = \tan^2 x$

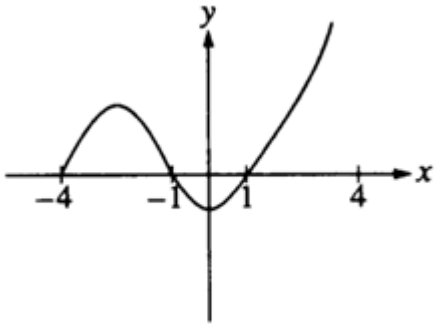
_____ 22. The graph of which of the following equations has $y = 1$ as an asymptote?

(A) $y = \ln x$ (B) $y = \sin x$ (C) $y = \frac{x}{x+1}$ (D) $y = \frac{x^2}{x-1}$ (E) $y = e^{-x}$

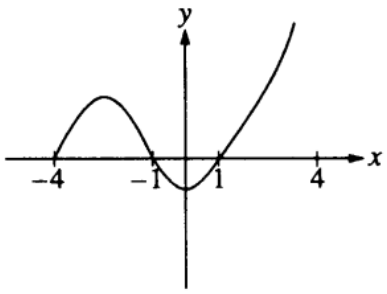
_____ 23. The fundamental period of $2\cos(3x)$ is

(A) $\frac{2\pi}{3}$ (B) 2π (C) 6π (D) 2 (E) 3

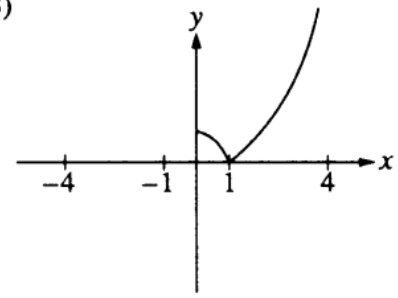
_____ 24. The graph of $y = f(x)$ is shown in the figure below. Which of the following could be the graph of $y = f(|x|)$?



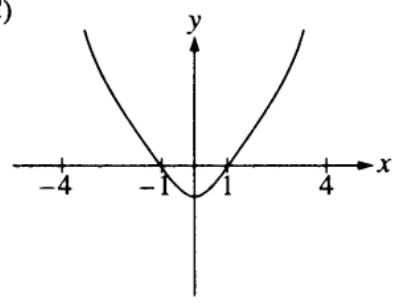
(A)



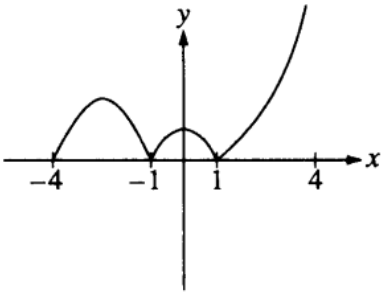
(B)



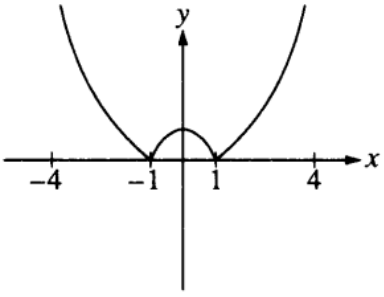
(C)



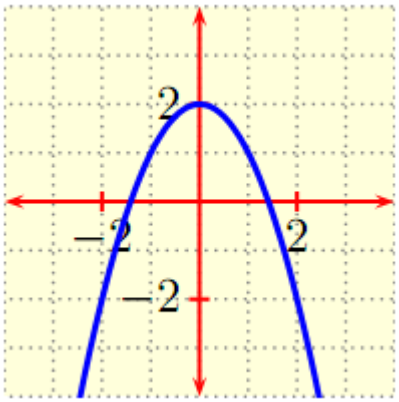
(D)



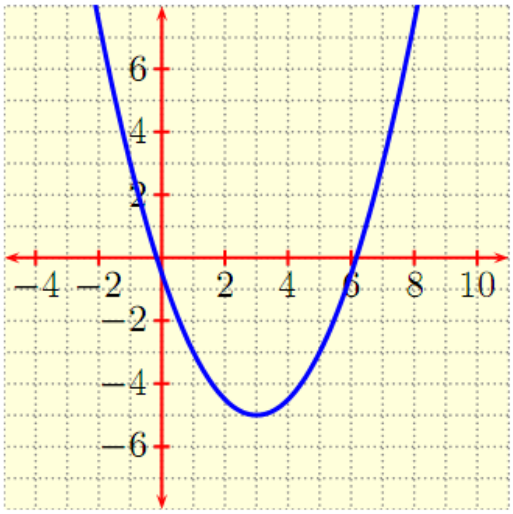
(E)



_____ 25. If



is the graph of $f(x)$, which function $g(x)=Af(x-C)+D$ has



as its graph?

(A) $g(x)=-f(x-3)-5$ (B) $g(x)=\frac{1}{2}f(x-3)-4$ (C) $g(x)=-\frac{1}{2}f(x+3)+4$

(D) $g(x)=f(x-3)-5$ (E) $g(x)=-\frac{1}{2}f(x-3)-4$ (F) $g(x)=f(x+3)+4$

_____ 26. Find the function *g* that is finally graphed after the following sequence of transformations are applied in the order given to the graph of a function *f*.

(1) reflect about the *x*-axis
(2) shift down 3 units
(3) stretch vertically by a factor of 2
(4) reflect about the *y*-axis

(A) $g(x)=2f(x)-6$ (B) $g(x)=2f(-x)+6$ (C) $g(x)=-2f(-x)-6$

(D) $g(x)=-2f(x)+6$ (E) $g(x)=-3f(-x)+6$