Name _____

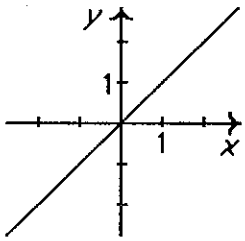
Concepts Worksheet 3

Chapter 1 For use after Article 1.5.

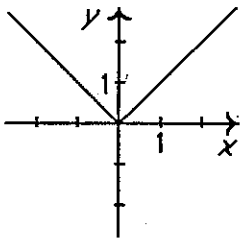
Graphical Interpretation of Absolute Value

The inclusion of absolute value in the description of a function can bring about dramatic changes. Note the following examples:

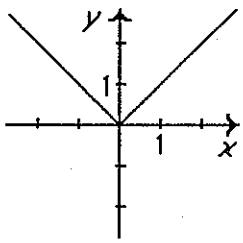
A. $f(x) = x$



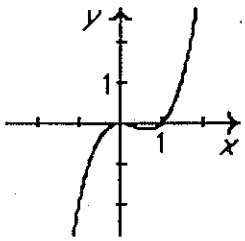
B. $f(|x|) = |x|$



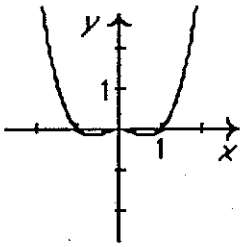
C. $|f(x)| = |x|$



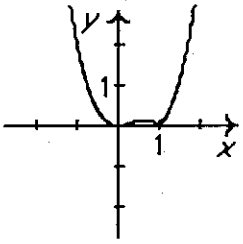
D. $f(x) = x^3 - x^2$



E. $f(|x|) = |x|^3 - |x|^2 = |x|^3 - x^2$

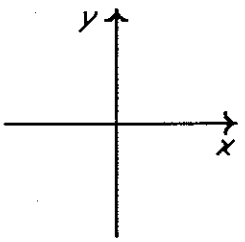


F. $|f(x)| = |x^3 - x^2|$

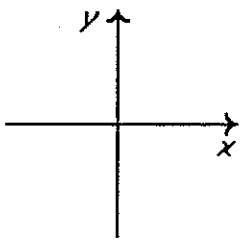


Sketch each $f(x)$ and subsequent transformations affected by absolute value. In addition, write a formula for each function.

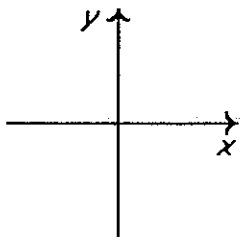
1. a. $f(x) = x^2 + x$



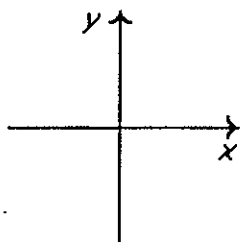
b. $f(|x|) =$ _____



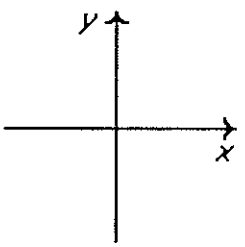
c. $|f(x)| =$ _____



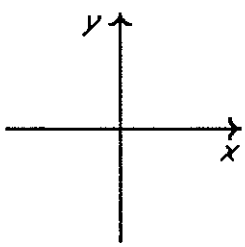
2. a. $f(x) = \sin x$



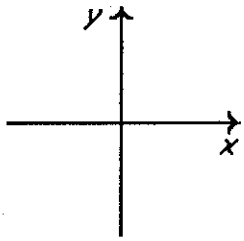
b. $f(|x|) =$ _____

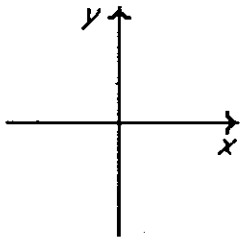


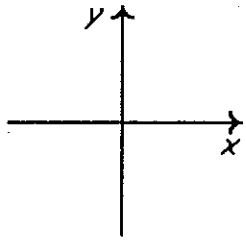
c. $|f(x)| =$ _____



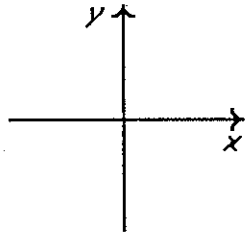
3. **a.** $f(x) = \cos x$ **b.** $f(|x|) =$ _____ **c.** $|f(x)| =$ _____

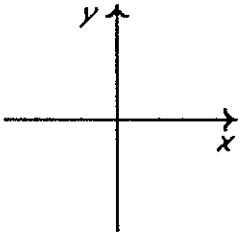


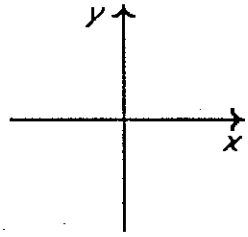




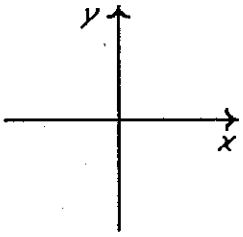
4. **a.** $f(x) = e^x$ **b.** $f(|x|) =$ _____ **c.** $|f(x)| =$ _____

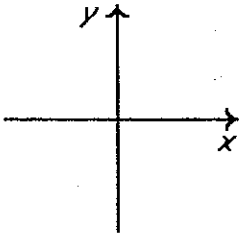


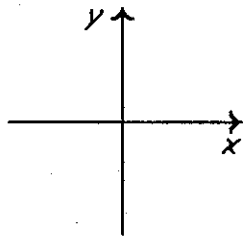




5. **a.** $f(x) = \ln x$ **b.** $f(|x|) =$ _____ **c.** $|f(x)| =$ _____







6. Describe the geometric transformation on $f(x)$ involved in graphing:

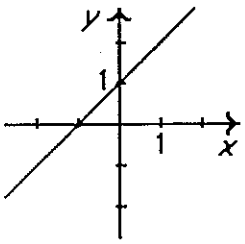
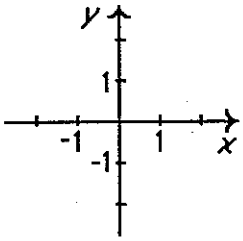
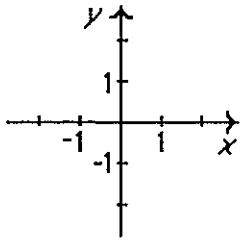
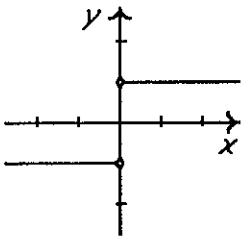
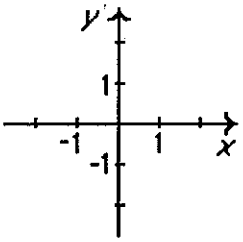
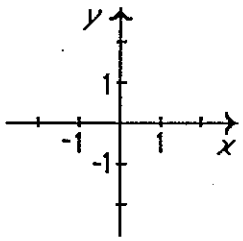
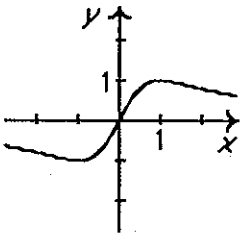
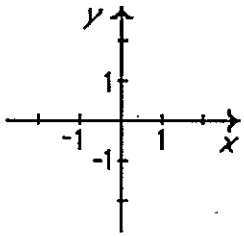
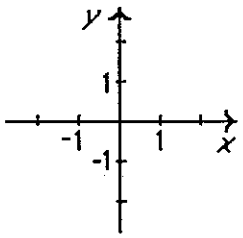
a. $f(|x|)$ _____

_____

b. $|f(x)|$ _____

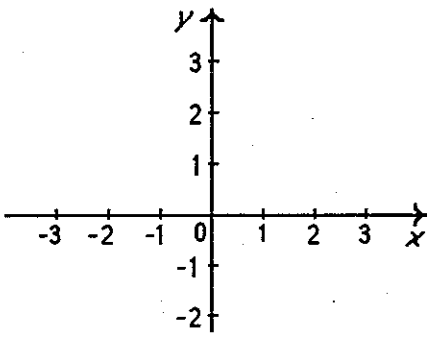
_____

Complete the graphs in the table below:

Graph of $f(x)$	Graph of $f(\|x\|)$	Graph of $\|f(x)\|$
7. 		
8. 		
9. 		

Concept Connectors

10. Graph $f(x) = |\ln |x||$.



11. Identify a class of functions where $f(x)$ and $f(|x|)$ have the same graphs.

_____

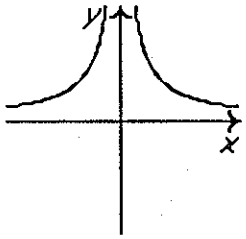
12. Identify a class of functions where $f(x)$ and $|f(x)|$ have the same graphs.

_____

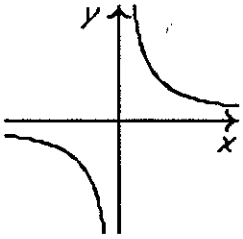
13. Identify a class of functions where $f(x)$, $f(|x|)$, and $|f(x)|$ have the same graphs.

_____

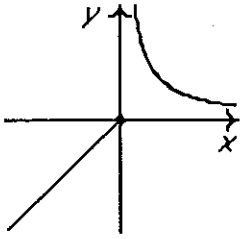
14. A.



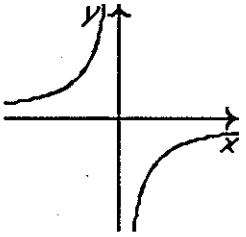
B.



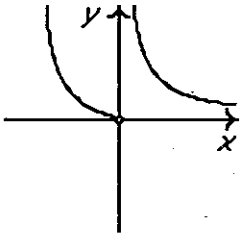
C.



D.

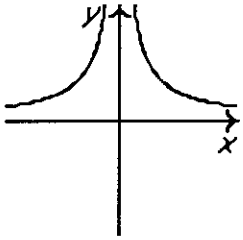


E.



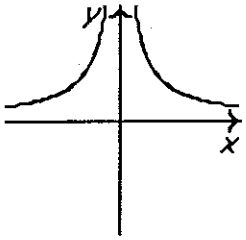
Which of the choices A–E above are appropriate graphs of $f(x)$ given that the graphs below represent:

a. $f(|x|)$



_____

b. $|f(x)|$



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