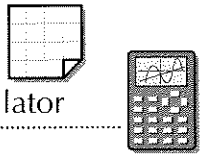
THINKING WRITING

12.B V-Shaped Graphs

You will need:

graph paper

graphing calculator (optional)



THE SQUARE ROOT OF x^2

As you know, the radical sign means *the nonnegative square root of.*

1. Make a table of values, and a graph, for the function $y = \sqrt{x^2}$. Use at least six values for x, including positive numbers, negative numbers, and zero.
2. Find a linear function that has the same graph as $y = \sqrt{x^2}$, when
   a. x is positive; b. x is negative.
3. True or False? $\sqrt{x^2} = x$. Explain.

ABSOLUTE VALUE

As you may remember, the absolute value of a number is the distance between that number and zero.

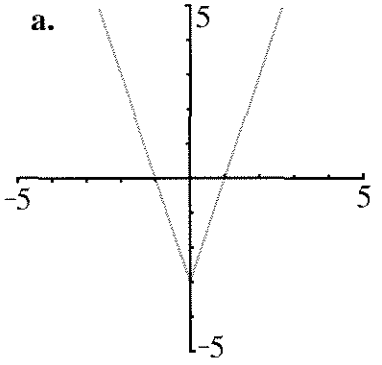
4. Repeat problems 1-3 for the function $y = |x|$.

Graph the functions in problems 5 through 10. Use separate axes for each one. Write each equation on its graph.

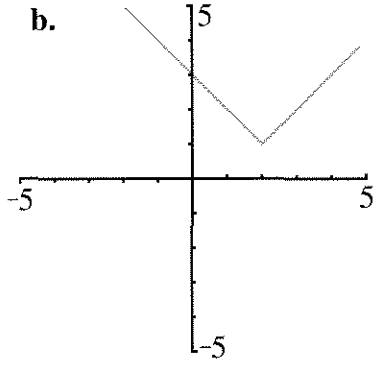
5. $y = |x| + 2$
6. $y = |x| - 2$
7. $y = -|x|$
8. $y = 2|x|$
9. $y = |x + 2|$
10. $y = |x - 2|$

11. **Exploration** Find equations of the form $y = A|x - H| + V$ for these four graphs.

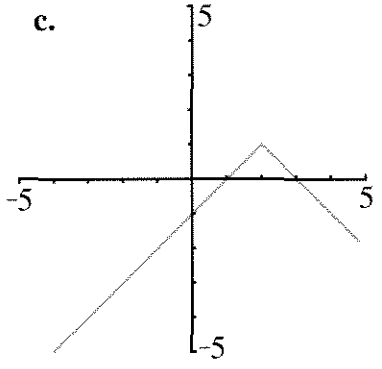
a.



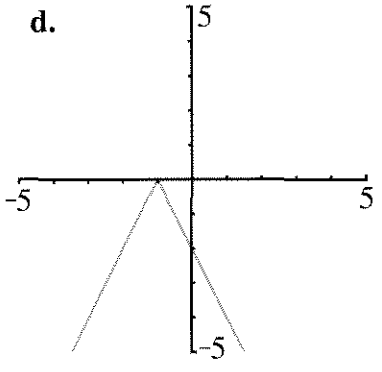
b.



c.



d.



12. Report Write an illustrated report describing graphs of the form $y = A|x - H| + V$. Describe how each of the parameters A, H, and V affects the graph. What are the slopes? Where is the vertex? What are the domain and range? Give examples, including both negative and positive values of all the parameters.

13. Describe the plane's trip.

14. The equation of the graph is of the form $y = A|x - H| + V$. What are A, H, and V?

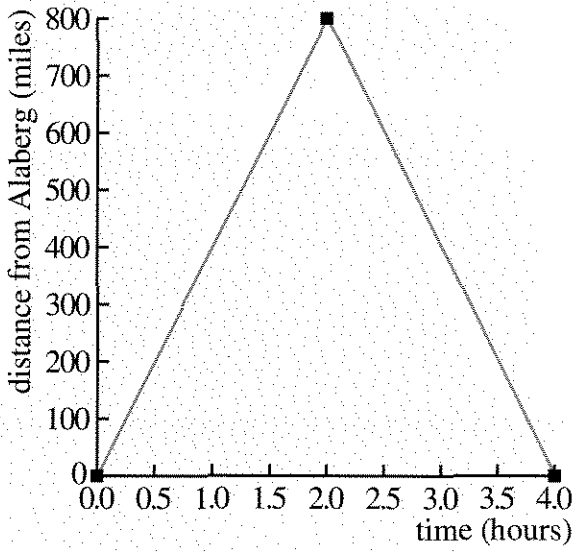
15. If the plane were going at 300 miles per hour,

a. how would the graph be different?

b. how would the equation be different?

A ROUND TRIP

This graph shows a plane's trip. It was sighted passing over Alaberg at time $t = 0$.



REVIEW LIKE TERMS

When combining terms involving fractions, it is sometimes useful to write the fractions with common denominators. However, it is often more convenient to use the method that is demonstrated in the following example.

Example:

$$\frac{x}{60} - \frac{11x}{70}$$

$$= \frac{1}{60}x - \frac{11}{70}x$$

$$= \left(\frac{1}{60} - \frac{11}{70}\right)x$$

$$= -0.14x$$

(A calculator was used for the last step.)

Combine like terms.

16. $\frac{2x}{3} - 4x$

17. $\frac{5x}{6} + \frac{7}{8} + \frac{9x}{4}$

18. $\frac{3x + 2}{5} - \frac{x}{2}$