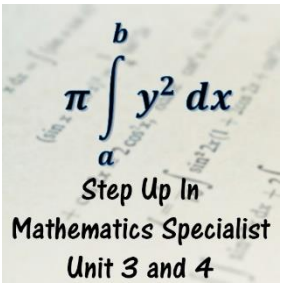
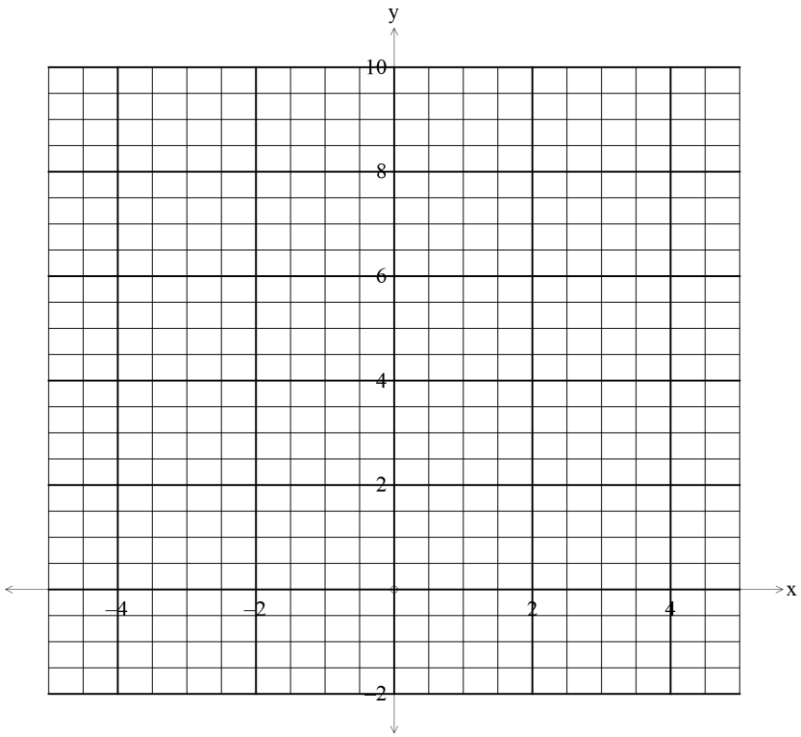
# 2.3 Absolute Value Functions

*Problems Worksheet*

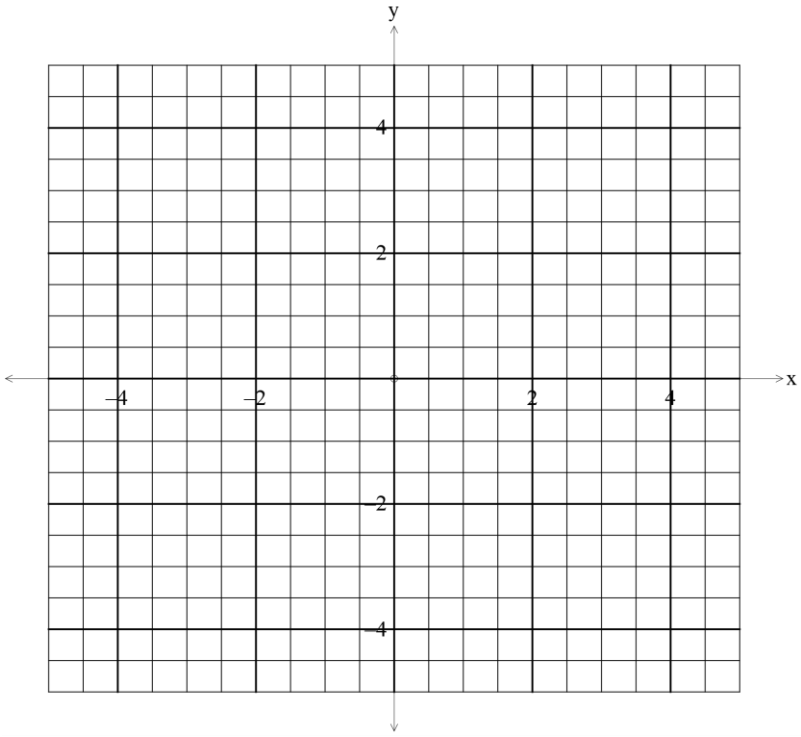



1. For each of the following functions, first write them as piecewise-defined functions, and then sketch them.

   a. $f(x) = 2|x - 3|$




   b. $g|x| = -|x + 1| + 2$





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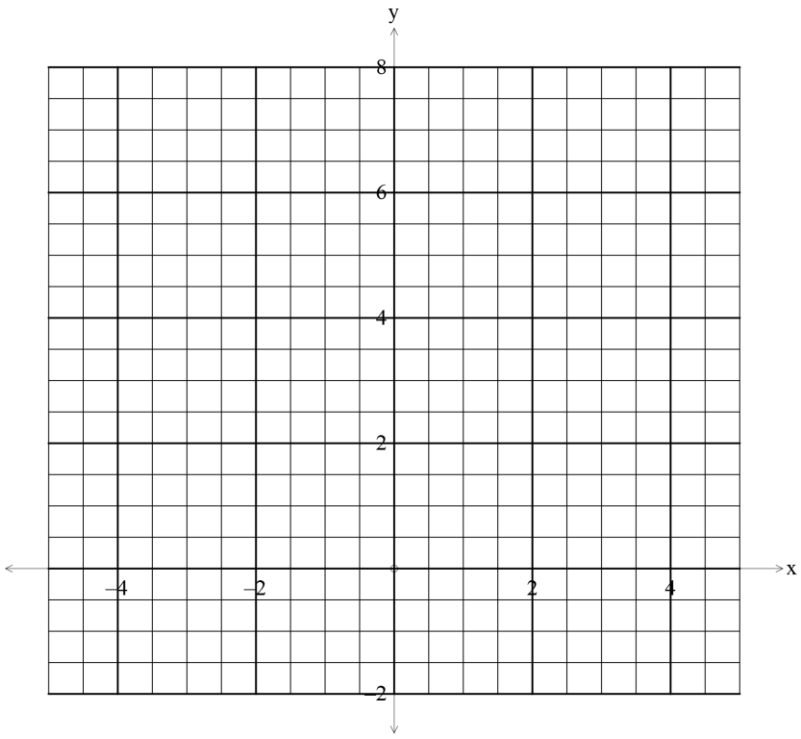
c. $h(x) = |x + 1| + |x - 3|$




2. Solve the following equations involving absolute value functions, where the variable lies on the real number line.

a. $|a + 1| = 5$

b. $|2b - 5| = 13$

c. $|-3c - 12| = -6$

d. $|2d + 1| = |2d - 5|$

e. $|2e + 1| = |e - 4|$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3. Solve the following equations involving absolute value functions, where the variable lies on the real number line.

   a. $|2a + 1| = |-a - 3|$

   b. $|b + 2| + |b - 2| = 6$

   c. $|c + 4| - |c - 1| = 1$

   d. $|d - 3| = |d + 2| + 3$

   e. $|e + 2| - 2 = |e - 1|$


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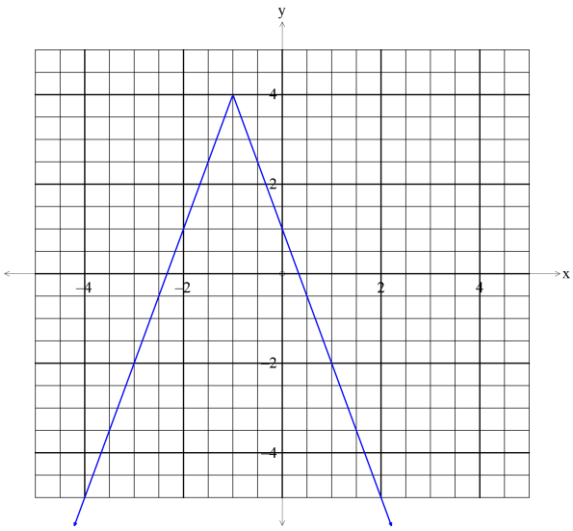
4. The function presented is of the form $y = a|bx + c| + d$. Determine the values of $a$, $b$, $c$ and $d$.




5. For each of the following problems, use a simple diagram to communicate your working.

   a. Consider the inequality $|x - a| \leq 6$. If the solution set to this inequality is given by $-2 \leq x \leq 10$, determine the value of $a$.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b. Consider the inequality $-|2x-3|+b \geq -3$. If the solution set to this inequality is given by $-\frac{1}{2} \leq x \leq \frac{7}{2}$, determine the value of $b$.

c. Consider the equation $|x+2| = |x-c| - 3$. If the solution set to this equation is given by $x \leq -2$, determine the value of $c$.


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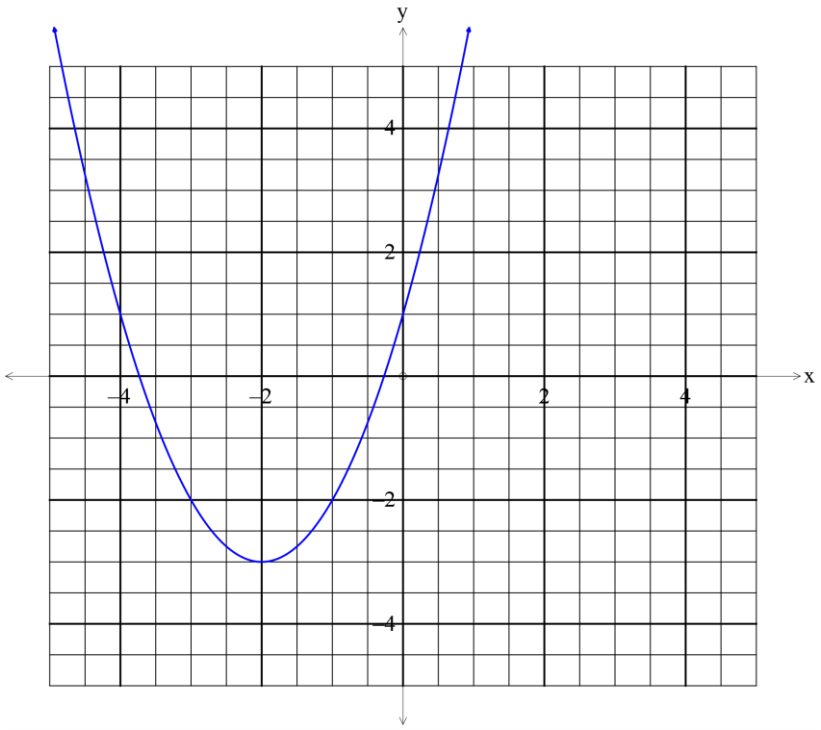
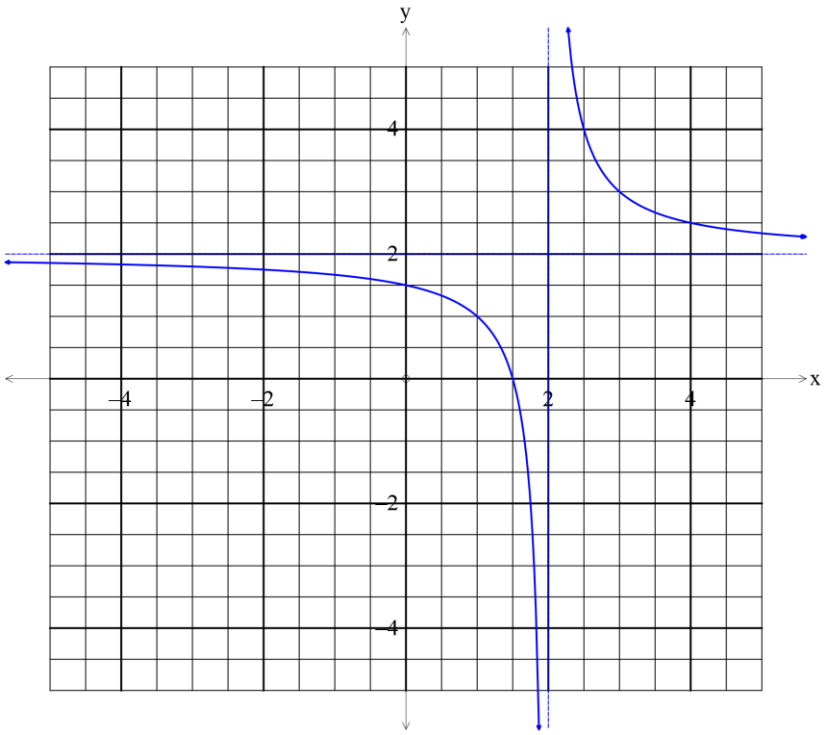
6. For each of the graphs $f(x)$ presented, sketch $\frac{1}{f(x)}$ on the same set of axes.

a.




b.





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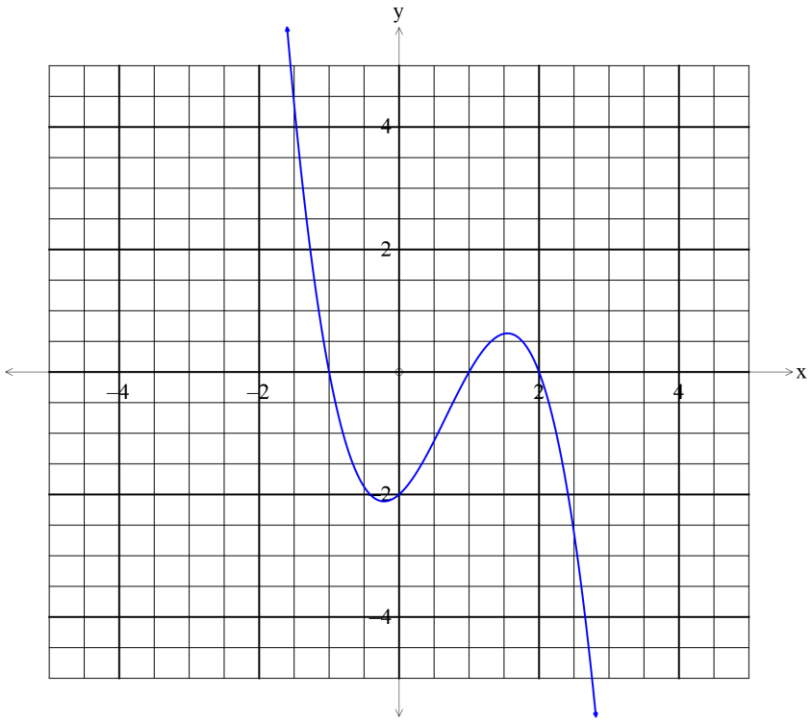
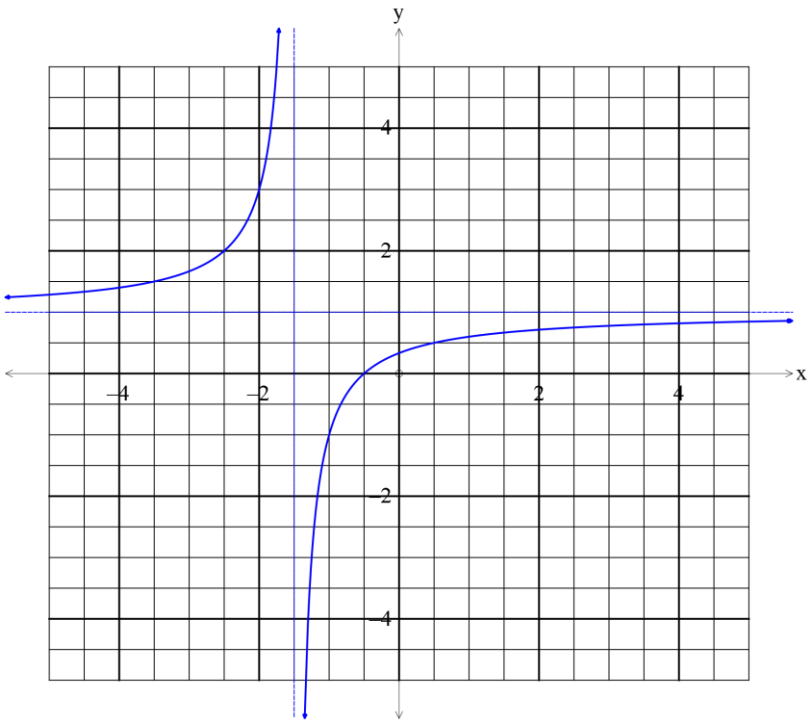
7. For each of the graphs $f(x)$ presented, sketch $|f(x)|$ on the same set of axes.

a.




b.





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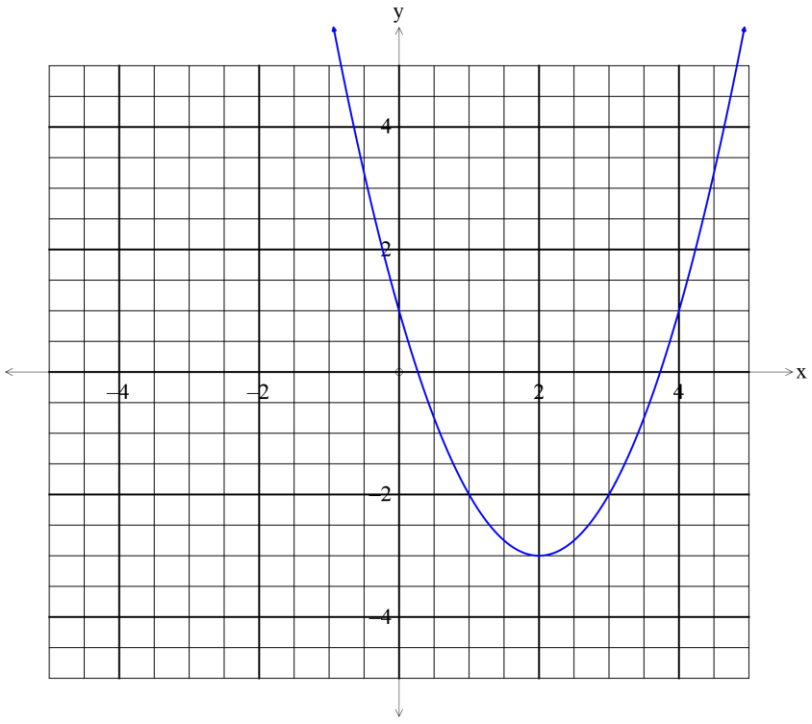
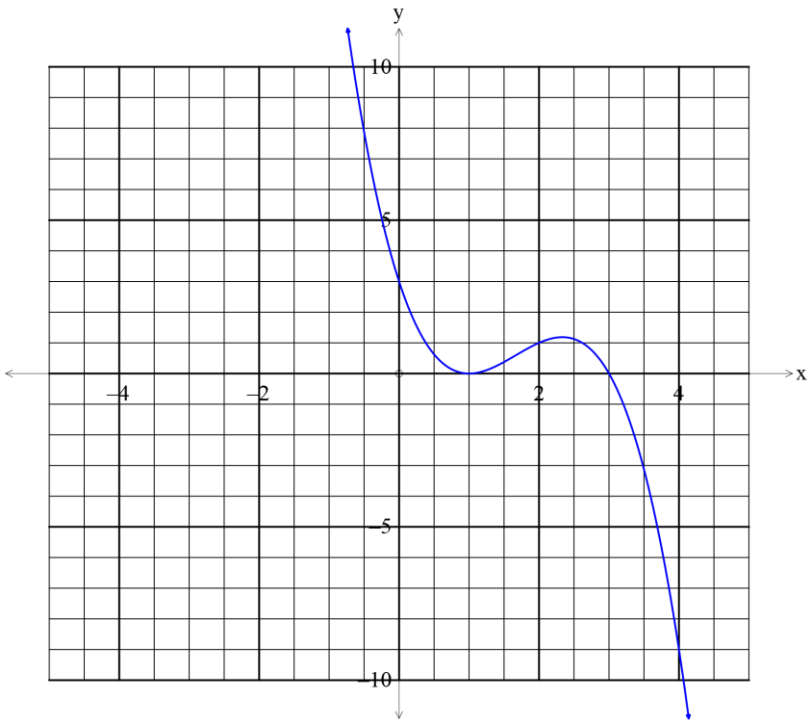
8. For each of the graphs $f(x)$ presented, sketch $f(|x|)$ on the same set of axes.

a.




b.





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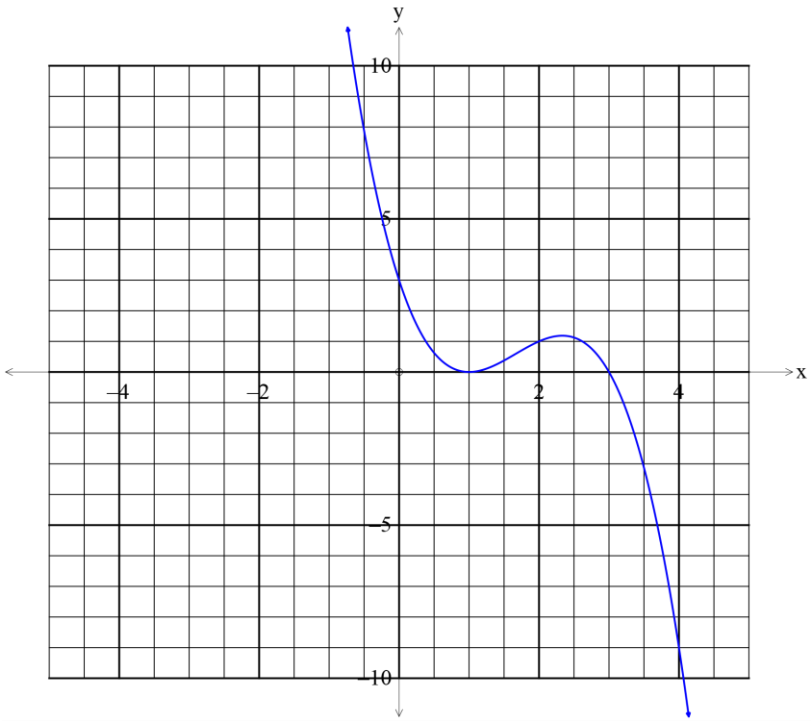
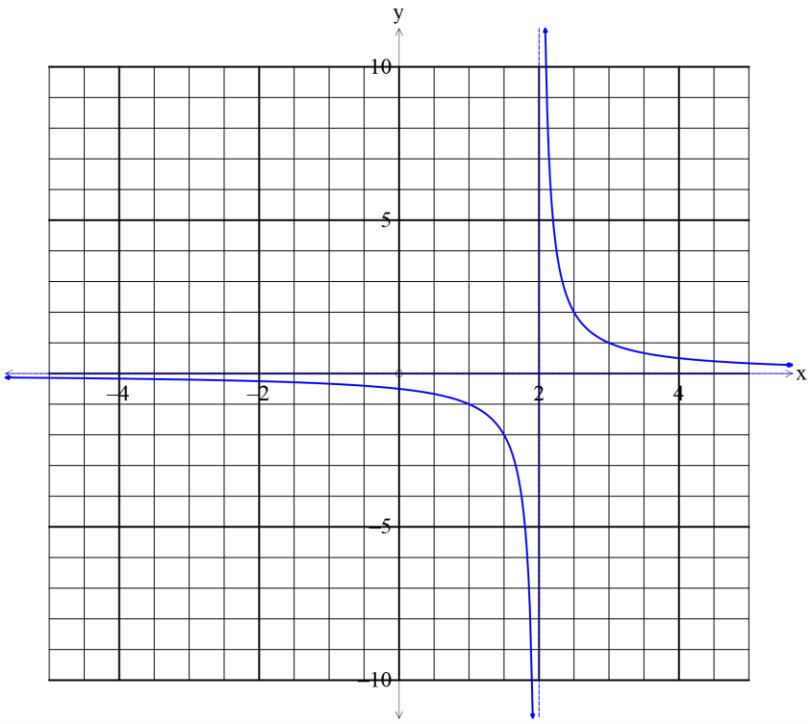
9. For each of the graphs $f(x)$ presented, sketch $|f(|x|)|$ on the same set of axes.

a.




b.





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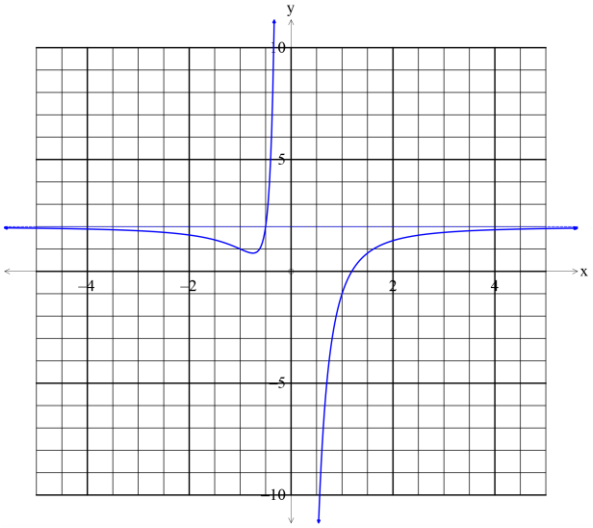
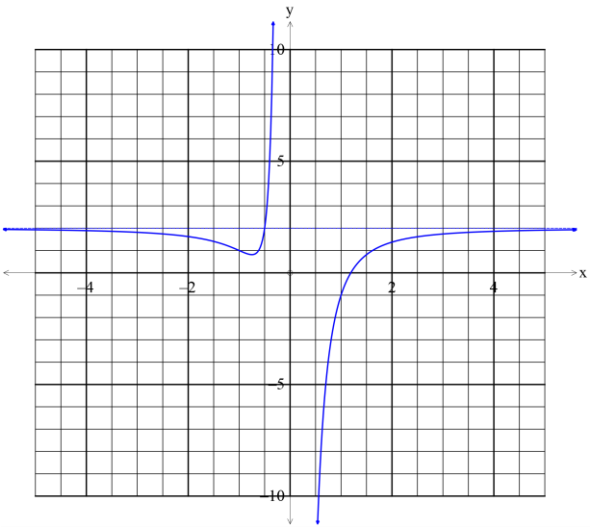
10. Some arbitrary $f(x)$ is sketched on each set of axes. Upon each, complete the required sketch.

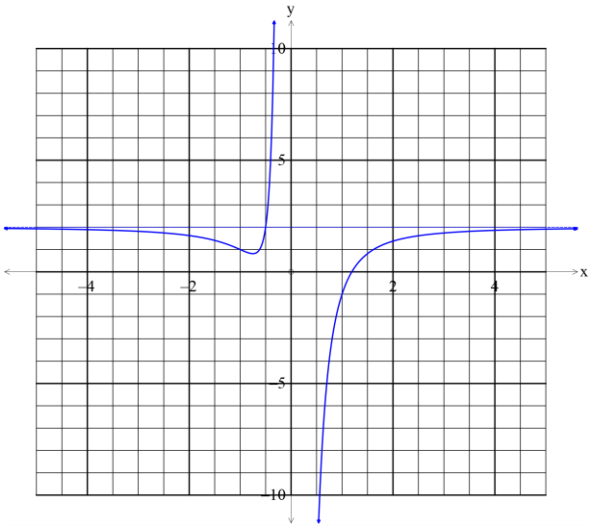
a. $\frac{1}{f(x)}$



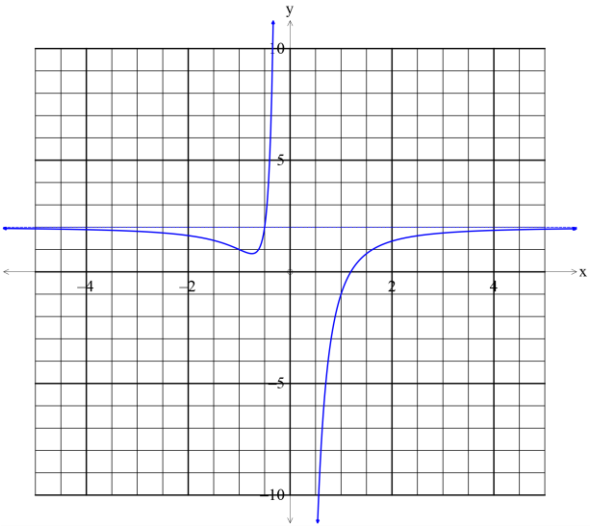

b. $|f(x)|$




c. $f(|x|)$




d. $|f(|x|)|$





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