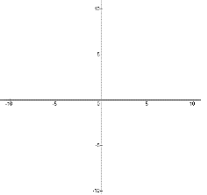
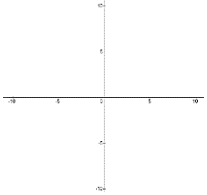
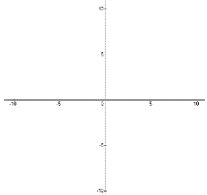
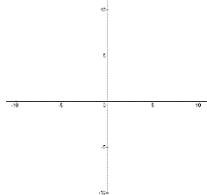
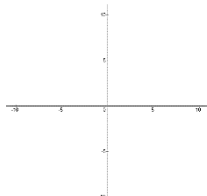
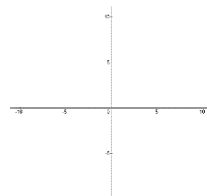


Domain, Range, and Piecewise Functions Investigation

State the domain and range for problems 1 - 6. Put answers in set builder notation.

Use calculator or Desmos to sketch graphs for problems 1-6.

<p>1. $y = \sqrt{x}$</p> <p>Domain:</p> <p>Range:</p> 	<p>2. $y = \sqrt{x-4} + 3$</p> <p>Domain:</p> <p>Range:</p> 
<p>3. $y = -\sqrt{x}$</p> <p>Domain:</p> <p>Range:</p> 	<p>4. $y = \sqrt{-x}$</p> <p>Domain:</p> <p>Range:</p> 
<p>5. $y = \frac{1}{x}$</p> <p>Domain:</p> <p>Range:</p> 	<p>6. $y = \frac{1}{x+1} + 2$</p> <p>Domain:</p> <p>Range:</p> 

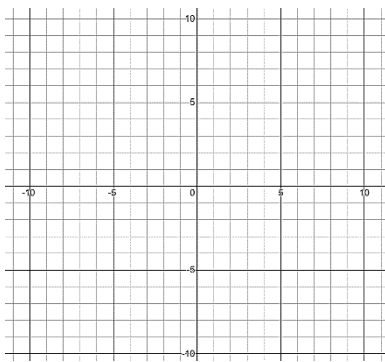
Just state the domain for problems 7 – 12. Put answers in set builder notation.

<p>7. $y = \sqrt{x^2 - 16}$</p> <p>Domain:</p>	<p>8. $y = \frac{1}{\sqrt{x^2-16}}$</p> <p>Domain:</p>
<p>9. $y = \sqrt{x^2 + 16}$</p> <p>Domain:</p>	<p>10. $y = \frac{5x}{x^2-3x-28}$</p> <p>Domain:</p>
<p>11. $y = x^2 + 16$</p> <p>Domain:</p>	<p>12. $y = \frac{1}{\sqrt{16-x^2}}$</p> <p>Domain:</p>

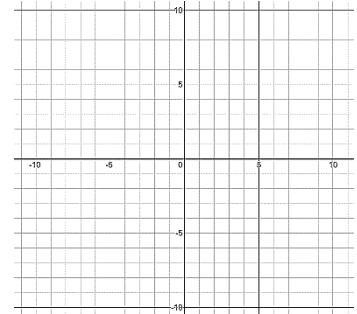
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Graph the following piecewise functions in 13-15.

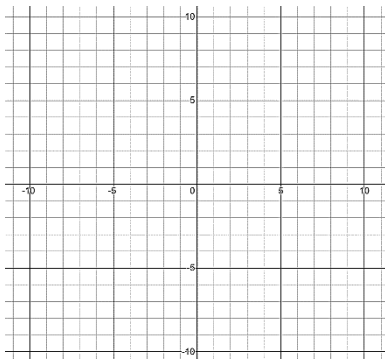
13. $y = \begin{cases} 2x, & x > 0 \\ 1, & x \leq 0 \end{cases}$



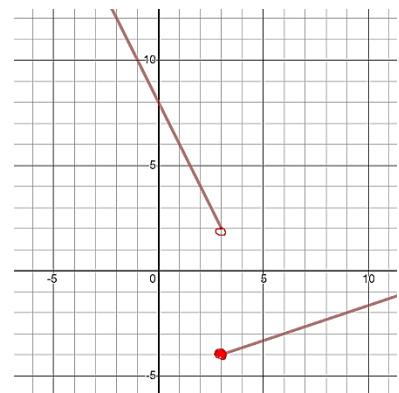
14. $y = \begin{cases} x - 1, & x \leq 2 \\ 2x - 3, & x > 2 \end{cases}$



15. $y = \begin{cases} x^2, & x \leq 1 \\ 3, & x > 1 \end{cases}$



16. Write the equation for the piecewise function shown.



17. It turns out that the monthly water usage for a house is charged using a piecewise function. By that, we mean the more water you use the more expensive each individual hundred of cubic foot of water becomes. If you read the table below, the way it works is the first 9 HCF of water you use it costs \$1.88 per HCF of water. After your first 9 HCF of water, it costs \$3.00 per HCF of water up until you've used 18 HCF of water and so on.

Note: HCF stands for hundred of cubic feet

Amount Used (HCF)	0-9	10-18	19-36	36+
Coste Per HCF	\$1.88	\$3.00	\$6.96	\$14.92

a) Write a piecewise function for the amount a house would be charged depending on their usage.

$f(x) =$

- b) Make sure you did it correctly by checking if you would have correctly charged \$228.88 for a house using 40 HCF of water. Check here if you go that: _____
- c) Use your piecewise function to determine how much it would cost if a house used 24 HCF of water in one month.