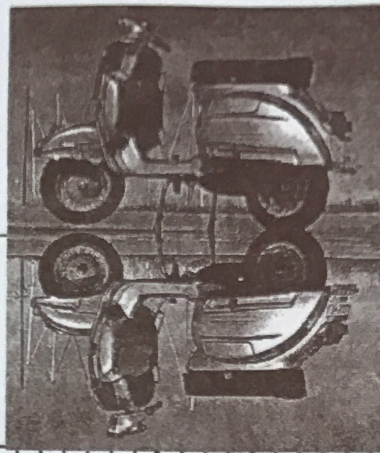


4.4 Reflections of a Bike Lover

A Practice Understanding Task



1. Graph the function $f(x) = x^2 - 4$
2. Graph $g(x) = |f(x)|$ on the same set of axes as $f(x)$.
3. Explain what happens graphically.

Explain, negative y-values become positive

4. Write the piecewise function for $g(x)$.

$$g(x) = \begin{cases} x^2 - 4 & -\infty < x \leq -2 \\ -(x^2 - 4) & -2 < x \leq 2 \\ x^2 - 4 & 2 < x < \infty \end{cases}$$



5. Explain your process for creating this piecewise function.

Explain in detail

6. Graph the function $f(x) = (x + 1)^2 - 9$

7. Graph $g(x) = |f(x)|$.

8. Explain what happens graphically?

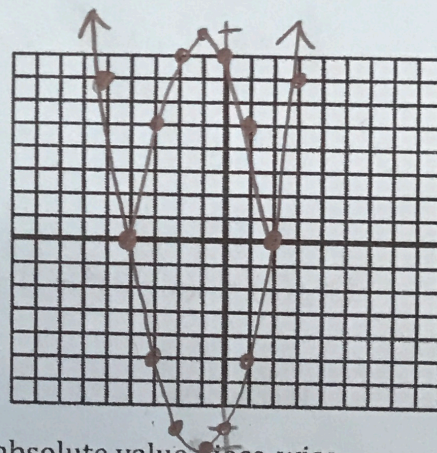
Explain

9. Write the piece-wise function for $g(x)$.

$$g(x) = \begin{cases} (x+1)^2 - 9 & -\infty < x \leq -4 \\ -(x+1)^2 + 9 & -4 < x \leq 2 \\ (x+1)^2 - 9 & 2 < x < \infty \end{cases}$$

10. What do you have to think about when writing any absolute value piece-wise function?

give at least 3 things

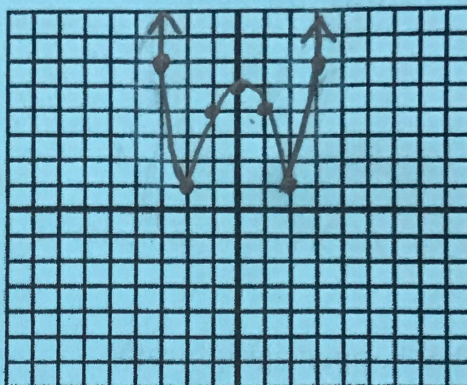


Graph the following absolute value functions and write the corresponding piecewise functions for each.

11. $g(x) = |x^2 - 4| + 1$

Piecewise:

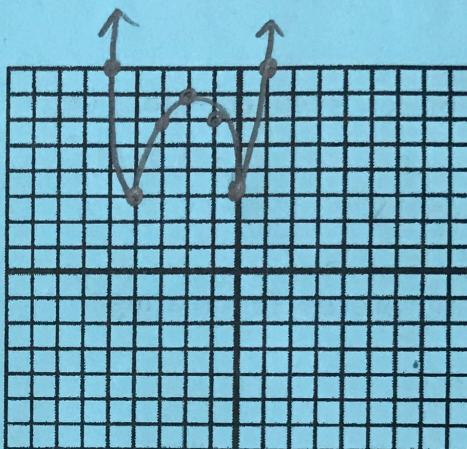
$$g(x) = \begin{cases} x^2 - 4 + 1 & -\infty < x \leq -2 \\ -(x^2 - 4) + 1 & -2 < x \leq 2 \\ x^2 - 4 + 1 & 2 < x < \infty \end{cases}$$



12. $g(x) = |(x + 2)^2 - 4| + 3$

Piecewise:

$$g(x) = \begin{cases} (x+2)^2 - 4 + 3 & -\infty < x \leq -4 \\ -(x+2)^2 - 4 + 3 & -4 < x \leq 0 \\ (x+2)^2 - 4 + 3 & 0 < x < \infty \end{cases}$$



13. $g(x) = |(x - 3)^2 - 1| - 2$

Piecewise:

$$g(x) = \begin{cases} (x-3)^2 - 1 - 2 & -\infty < x \leq 2 \\ -(x-3)^2 + 1 - 2 & 2 < x \leq 4 \\ (x-3)^2 - 1 - 2 & 4 < x < \infty \end{cases}$$

