

Unit 1 Day 8 Practice: Piecewise Functions

Use the piecewise function $f(x)$ below to answer the following questions:

$$f(x) \begin{cases} 3x, & \text{for } x < 0 \\ \frac{1}{x}, & \text{for } 0 \leq x < 2 \\ x^3, & \text{for } x \geq 2 \end{cases}$$

- Given $f(x)$, what input is not in the domain? Why? _____

- What would be the domain for the function, in interval notation? _____
- Evaluate $f(4) =$ _____
- Evaluate $f(-6) =$ _____
- What is the value of $f(9) =$ _____
- Find $2f(3) - f(1) - 3f(2) =$ _____

A cell phone company sells data based on the piecewise function below where x represents the number of gigabytes of data used and $c(x)$ represents the total monthly bill.

$$c(x) \begin{cases} 19.95x + 60, & 0 \leq x \leq 3 \\ 9.95x + 75, & 3 < x \leq 6 \\ 125, & x > 6 \end{cases}$$

- What would be the cost of your monthly bill if you used 3 gigabytes of data? _____
- How much would your bill be if you used 10 gigabytes of data? _____
- If you used 2 gigabytes of data this month, what was your bill? _____
- Explain what $c(5) = 124.75$ means in context. _____

Use the piecewise function $h(x)$ below to answer the following questions:

$$h(x) \begin{cases} 2^x, & x < -3 \\ \frac{3}{x}, & x \geq -3 \end{cases}$$

- What is $h(-4)$? _____
- Find $3h(1) + 2h(-3) - h(-6)$: _____

13. What is the domain of $h(x)$? _____

14. The parking rates at a garage are shown in the graph to the right.



- What is the fee for parking 2 hours? _____
- How much would it cost to park for $\frac{1}{2}$ hour? _____
- What is the cost park for $4\frac{1}{2}$ hours? _____

15. **The Charlotte Shipping Company needs to create an advertisement flyer for its new pricing for medium boxes shipped within Mecklenburg County. In the piecewise function below, c represents the cost and p represents pounds.**

$$c(p) = \begin{cases} 11.45, & p \leq 12\frac{1}{3} \\ .72p + 5.57, & p > 12\frac{1}{3} \end{cases}$$

- What would be the price to ship a 10 pound box? _____
- If someone's shipping bill was \$18.53, did their box weigh more or less than $12\frac{1}{3}$ pounds? How do you know? _____
 What was the weight of this box? _____

16. Sarah earns \$8 an hour for each hour worked in a week, up to 40 hours. After 40 hours, Sarah earns \$12 an hour. Create a piecewise function to represent Sarah's pay for working x hours in a week.

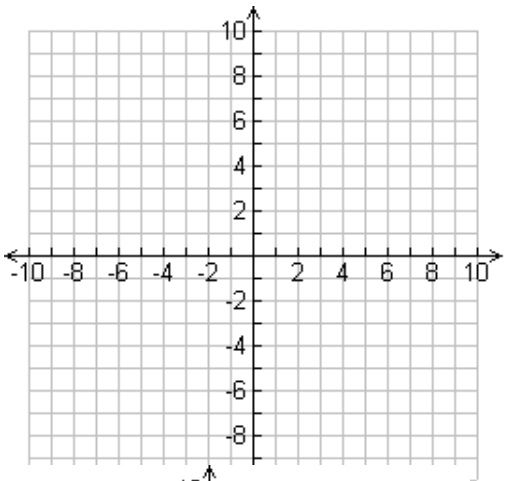
17. A dog groomer charges according to the weight of the dog. If the dog is 15 pounds and under, the groomer charges \$35. If the dog is between 15 and 40 pounds, it cost \$40. If a dog is over 40 pounds it cost \$40 plus an additional \$2 for each pound. Write a piecewise function to represent the cost of grooming a dog that weighs x pounds.

18. Renting a canoe costs a flat rate of \$20 for the first 4 hours, and a fee of \$3 per hour for each additional hour. Write a piecewise function to represent the cost of renting a canoe of x hours.

19. Graph the piecewise function below by creating tables. Then, identify the domain and range of each step.

$$\begin{cases} x^2 - 8, & x \leq -2 \\ 2x + 4, & -2 < x < 3 \\ -|x|, & 3 \leq x \leq 6 \end{cases}$$

<p>Step 1: Domain: _____ Range: _____</p> <p>Step 2: Domain: _____ Range: _____</p> <p>Step 3: Domain: _____ Range: _____</p>

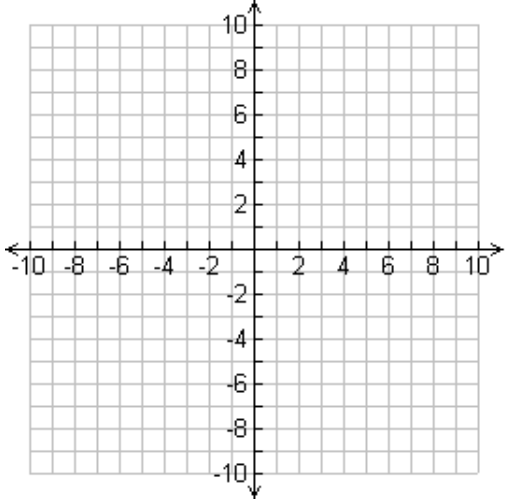


20. Graph the piecewise function below by creating tables. Then,

identify the domain and range of each step. $\begin{cases} \sqrt{x+8}, & x < -4 \\ -|x|, & -4 \leq x < 4 \\ -\sqrt{x}, & 4 \leq x \leq 9 \end{cases}$

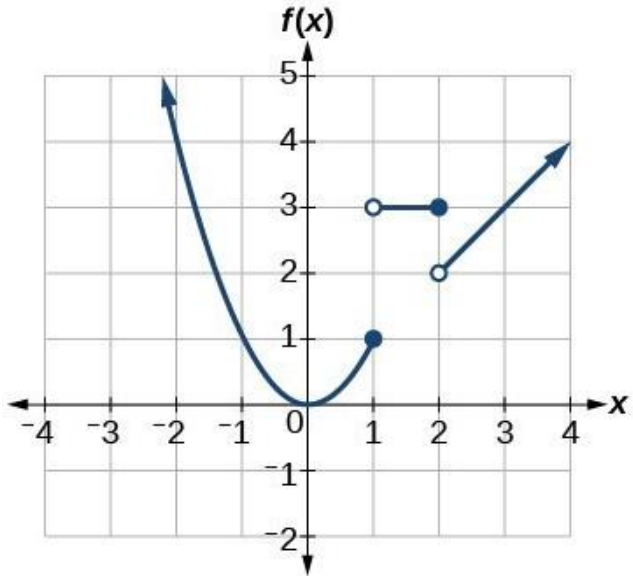
- Are there any restrictions on the domain of this function?

<p>Step 1: Domain: _____ Range: _____</p> <p>Step 2: Domain: _____ Range: _____</p> <p>Step 3: Domain: _____ Range: _____</p>



21. Given the graph of $f(x)$ to the right, create a piecewise function to match.

$$f(x) = \begin{cases} \text{_____} \\ \text{_____} \\ \text{_____} \end{cases}$$



22. Given the graph of $g(x)$ to the right, create a piecewise function to match

$$g(x) = \left\{ \begin{array}{l} \text{_____} \\ \text{_____} \end{array} \right.$$

