

CHAPTER 6 PRACTICE QUESTIONS

Directions: Complete the following open-ended problems as specified by each question stem. For extra practice after answering each question, try using an alternative method to solve the problem or check your work.

- Describe the domain, range, end behavior, x -intercept, y -intercept, and point of inflection for the graph of $f(x) = -\sqrt[3]{x - 6} + 2$.
- Graph the function $h(x) = |2x|$ for $-1 \leq x \leq 2$. What is the range for this function?
- If $g(x) = x^3 - 5x^2 + 3x + 9$, what are the x - and y -intercepts of its inverse relation? What is the minimum value of a for which the inverse relation of $g(x)$ with $x \geq a$ is a cube root function?
- Graph the function $f(x) = -4 \cdot 2^x + 16$.
- An absolute value function, $r(x)$, has a maximum at $(-4, 3)$ and a left arm with slope $3/2$. What equation describes $r(x)$?
- Find all solutions to the equation $1/2 x^2 - 5 = |x - 1|$.
- At Perry's Pretzel Parlor, employees are paid a starting hourly wage of \$12 for their first year working there. After that, their hourly wage increases by 10% each year, on the anniversary of their date of hire. The employee who has worked at Perry's Pretzel Parlor the longest has been there for 4 1/2 years. Write a function that gives $p(x)$, an employee's hourly wage, x years after being hired at Perry's Pretzel Parlor, for x -values up to 4.5. What kind of function is this?
- Naima was riding her skateboard at a constant speed of 0.2 mile per minute along a flat stretch of road. After riding 1.2 miles, she hit a downhill stretch, at which point her distance, d , in miles traveled downhill was given by $d = 0.1m^2 + 0.4m$, where m was the number of minutes since she started going downhill. Write and graph a piecewise-defined function that describes $s(x)$, her total distance traveled, throughout her entire 8-minute ride, where x is the number of minutes since she started the ride.
- The equation $N = A \cdot e^{kt}$ represents the continuous exponential decay of a radioisotope, where N represents the remaining quantity after t years, of an original quantity A , and k is a constant specific to a particular radioisotope. If 77% of an original sample of the radioisotope silicon-32 remains after 65 years, what is the half-life of silicon-32? (The half-life is the amount of time it takes half of the original quantity of a substance to decay.)