Woksheet on some prerequisite topics

Overview: This worksheet will help us review certain topics on which some students tend to need a refresher. These topics include: function terminology, piecewise functions, absolute value expressions, algebra with exponents and radicals, etc.

1. Give 2 different examples to illustrate each of the following function types

   (a) Linear function
   (b) Nonlinear function
   (c) Polynomial function

   (d) Rational function
   (e) Exponential function
   (f) Quadratic function

2. Sketch a graph of the function

$$f(x) = \begin{cases} 1 - 2x, & \text{if } x \leq 0 \\ x^2, & \text{otherwise} \end{cases}$$

   Graph must include detailed labels, and indicate open/closed intervals as needed.

3. Sketch a graph of the function

$$g(x) = \begin{cases} 1 - 2x, & \text{if } x \leq -1 \\ x^2, & \text{if } |x| < 1 \\ \sqrt{x}, & \text{if } x \geq 1 \end{cases}$$

   (As before, include detailed labels, and indicate open/closed intervals as needed.)

4. Solve each of the following for x

   (a) $|x - 9| = 7x$

   (b) $|x| - 9 = 7x$

   (c) $|x^2 - 5| = 4$

   (d) $\sqrt{\dfrac{3 - x}{x + 2}} = 2$

5. Simplify the expressions:

   (a) $\dfrac{a^3 (2a)^{-5}}{2a^2}$

   (b) $\dfrac{\sqrt[3]{r\sqrt{s}}}{r\sqrt{s}}$

6. Suppose f is an even function. Define what that means, and sketch a graph showing an example of such a function.

7. Suppose g is an odd function. Define what that means, and sketch a graph showing an example of such a function.