

Name: _____

Worksheet 4 – absolute value, square roots, and inequalities

If you had trouble with question 4a or 4b, do these problems.

1. Graph the function $f(x) = |x - 2|$ and then solve the inequality $|x - 2| < 1$.

Method 1: The function $|x - a|$ measures how far away x is from a . Use your graph or a number line to solve the inequality.

Method 2: $|x - a| < b$ is the same as $-b < x - a < b$. (Prove this to yourself.) Solve to get $a - b < x < a + b$.

2. Solve these inequalities for x .

(a) $|x - 3| < 4$.

(b) $\left| \frac{x - 3}{2} \right| < 1$

(c) $\left| \frac{x - 1}{4} \right| < 1$

(d) $|4(x - 1)| < 1$

3. Solve the following inequalities for x :

(a) $1/x < 4$

(b) $-x < 1$

(c) $\sqrt{x} < 4$

Careful – what is the domain of \sqrt{x} ?

(d) $\sqrt{x} > 4$

(e) $\sqrt{\frac{1}{x}} < 4$

(f) $\ln(x) < 1$

4. For which values of x does $\sqrt{x^2} = x$? True or False: $\sqrt{x^2} = |x|$ for all x .

5. Solve $\sqrt{4 - x^2} < 1$.

6. Suppose that x is in the interval $[0, 1/10]$, and y is between x and 0. What is the largest that x^2y^3 can be?