9.3 Absolute Value Equations and Inequalities **Math 55 Professor Busken**

Objectives

- Solve Absolute Value Equations
- Solve Absolute Value Inequalities

Exercises

1. Solve.

a) $|x| = 5$ b) $|x| = -5$ c) $|4t| = 12.8$ d) $5|x| - 6 = 4$

e) $|x + 7| = 16$ f) $\left|\frac{x}{4} - 3\right| = 1$ g) $|3m + 2| + 6 = -4$ h) $2|3m + 2| + 16 = 20$

i) $|7x| = 0$ j) $|5x + 9| = |x + 4|$

2. Solve and graph. Express your answers in interval notation.

a) $|x| \le 2$ b) $|x| \ge 3$ c) $|x - 1| > 2$ d) $|x + 2| < 1$

3. Solve. Express your answers in interval notation.

a) $|x+5|+2 \ge 8$ b) $-3+|5x-2| \le 4$ c) $\left|\frac{x+6}{3}\right| > 2$ d) $3-|2x-7| \ge 14$

e) $5 + |x| \le 2$ f) $8 + |x| < 1$ g) $5 + |x| \ge 4$ h) $|4 + 9x| \ge -6$

Answers: 1a) $-5,\ 5$ 1b) $\emptyset,$ 1c) $-3.2,\ 3.2,$ 1d) $-2,\ 2$ 1e) $-23,\ 9,$ 1f) $8,\ 16$

1g) $\emptyset,$ 1h) $0, -4/3,$ 1i) $0,$ 1j) $-13/6,\ -5/4$

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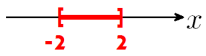
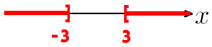
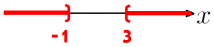


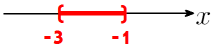
(a) $[-2, 2]$



(b) $(-\infty, -3] \cup [3, \infty)$



(c) $(-\infty, -1) \cup (3, \infty)$



(d) $(-3, -1)$

3a) $(-\infty, -11] \cup [1, \infty)$ 3b) $[-1,\ 9/5],$ 3c) $(-\infty, -12) \cup (0, \infty),$ 3d) $[-2, 9]$

3e) $\emptyset,$ 3f) $\emptyset,$ 3g) $(-\infty, \infty),$ 3h) $(-\infty, \infty)$