

2 | 11 2.8 More Absolute Value Equations

Ex1: $|5x - 1| = |-2x + 1|^2$

$$|5x - 1| = (-2x + 1)^2$$

$$5x - 1 = (-2x + 1)^2 \quad \text{or} \quad 5x - 1 = -(-2x + 1)^2$$

$$5x - 1 = 4x^2 - 4x + 1 \quad ; \quad 5x - 1 = -(4x^2 - 4x + 1)$$

$$0 = 4x^2 - 9x + 2 \quad ; \quad 5x - 1 = -4x^2 + 4x - 1$$

$$0 = (4x - 1)(x - 2) \quad ; \quad 4x^2 + 1x = 0$$

$$4x - 1 = 0 \quad x - 2 = 0 \quad ; \quad x(4x + 1) = 0$$

$$x = \frac{1}{4} \quad x = 2 \quad ; \quad x = 0 \quad 4x + 1 = 0$$

$$x = \left\{ \frac{1}{4}, 2, 0, -\frac{1}{4} \right\} \quad x = -\frac{1}{4}$$

Ex2: $3|2x+1| = |2x+1|^2$

let $m = |2x+1|$

$$3m = m^2$$

$$0 = m^2 - 3m$$

$$0 = m(m-3)$$

$$m=0 \quad m=3$$

$$|2x+1|=0 \quad |2x+1|=3$$

$$2x+1=0$$

$$2x=-1$$

$$x = -\frac{1}{2}$$

$$2x+1=3$$

$$2x=2$$

$$x=1$$

$$2x+1=-3$$

$$2x=-4$$

$$x=-2$$

$$X = \left\{ -\frac{1}{2}, 1, -2 \right\}$$

Ex3:

$$|1-3x|^2 - 3|1-3x| - 10 = 0$$

$$\text{let } a = |1-3x|$$

$$a^2 - 3a - 10 = 0$$

$$(a-5)(a+2) = 0$$

$$a = 5$$

$$a = -2$$

$$|1-3x| = 5$$

$$|1-3x| = -2$$

$$1-3x = 5$$

$$1-3x = -5$$

$$-3x = 4$$

$$-3x = -6$$

$$x = -\frac{4}{3}$$

$$x = 2$$

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$$x = \left\{ -\frac{4}{3}, 2 \right\}$$

HW Wksht 38,43-47 all