# Questions From Homework

(33) b) $x = 6 + \sqrt{x-6}$

$(x-6)^2 = (\sqrt{x-6})^2$

$x^2 - 12x + 36 = x - 6$

$x^2 - 13x + 42 = 0$

Factor: $-6 \times -7 = 42$, $-6 + -7 = -13$

$(x-6)(x-7) = 0$

$x - 6 = 0$ | $x - 7 = 0$

$x = 6$ | $x = 7$

Test your solutions:

$x = 6$

$x = 6 + \sqrt{x-6}$

$6 = 6 + \sqrt{6-6}$

$6 = 6 + 0$

$6 = 6$

$x = 6$ is a solution.

$x = 7$

$x = 6 + \sqrt{x-6}$

$7 = 6 + \sqrt{7-6}$

$7 = 6 + \sqrt{1}$

$7 = 6 + 1$

$7 = 7$

$x = 7$ is a solution.

# Absolute Inequalities

$$|x-1| \leq 5$$

$x - 1 \leq 5$

$x \leq 6$

$x - 1 \geq -5$

$x \geq -4$

$$-4 \leq x \leq 6$$

# Absolute Inequalities

$$|2x+3| \geq 9$$

$2x+3 \geq 9$

$2x \geq 6$

$x \geq 3$

$2x+3 \leq -9$

$2x \leq -12$

$x \leq -6$

# Absolute Rational Inequalities

$$\left|\frac{x+2}{x+1}\right| \le 2 \qquad \frac{x+2}{x+1} \le 2 \qquad \frac{x+2}{x+1} \ge -2$$

denom is positive

Case 1 $x+1>0$

$\frac{x+2}{x+1} \le 2$

$x+2 \le 2x+2$

$-x \le 0$

$x \ge 0$

$\frac{x+2}{x+1} \ge -2$

$x+2 \ge -2x-2$

$3x \ge -4$

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

denom is negative

Case 2 $x+1<0$

$\frac{x+2}{x+1} \le 2$

$x+2 \ge 2x+2$

$-x \ge 0$

$x \le 0$

$\frac{x+2}{x+1} \ge -2$

$x+2 \le -2x-2$

$3x \le -4$

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

# Absolute Inequalities

$$5 < |x+2| < 10$$

$5 < x+2 < 10$

$3 < x < 8$

$-5 > x+2 > -10$

$-7 > x > -12$

$-12 < x < -7$

# Homework