Equation exercises

Solve the following equations:

1. $$|-2x+3| > log_{1/5}(1/125)$$

2. $$\frac{1}{9^x} = 27^{\sqrt{x}-3}$$

Solutions

1.

$$|-2x+3| > log_{1/5}(1/125)$$
$$|-2x+3| > 3$$

Let's see the first case:

$$-2x+3 > 3$$
$$-x > 0$$
$$x < 0$$

Let's see the second case

$$-2x+3 < -3$$
$$6 < 2x$$
$$3 < x$$
$$x \in (-\infty, 0) \cup (3, \infty)$$

2.

$$\frac{1}{9^x} = 27^{\sqrt{x}-3}$$
$$9^{-x} = 27^{\sqrt{x}-3}$$
$$(-x)log_2 7(9) = \sqrt{x} - 3$$
$$-x(2/3) = \sqrt{x} - 3$$
$$-x(2/3) + 3 = \sqrt{x}$$
$$(-x(2/3) + 3)^2 = x$$
$$(4/9)x^2 - 4x + 9 = x$$
$$(4/9)x^2 - 5x + 9 = 0$$

The roots are: 2.25 and 9. However, 9 does not satisfy the equality. Therefore, $x = 2.25$ is the answer.