

$$1) x^2 - 7|x| + 6 = 0$$

$$|x|^2 - 7|x| + 6 = 0$$

$$t = |x|$$

$$t^2 - 7t + 6 = 0$$

$$t_1 = 1$$

$$t_2 = 6$$

$$|x| = 1$$

$$x = \pm 1$$

$$x = \pm 6$$

$$\text{Отв: } \pm 6; \pm 1$$

$$3) x^2 + 2x + 2|x + 1| = 7$$

$$|x|^2 - 7 + 2x + 2|x + 1| = 0$$

$$|x|^2 + 1 - 8 + 2x + 2|x + 1| = 0$$

$$x < 0$$

1 способ

$$x^2 + 1 - 8 + 2x + 2|x + 1| = 0$$

$$x^2 + 1 + 2x + 2|x + 1| - 8 = 0$$

$$(x+1)^2 + 2|x + 1| - 8 = 0$$

$$|x+1|^2 + 2|x + 1| - 8 = 0$$

$$|x + 1| = t$$

$$t^2 + 2t - 8 = 0$$

$$t_1 = -1 + \sqrt{10}$$

$$t_2 = -1 - \sqrt{10}$$

$$\{-1 + \sqrt{10} > 0\}$$

$$\{x+1 = -1 + \sqrt{10}\}$$

$$\{-1 + \sqrt{10} > 0\}$$

$$\{x+1 = 1 - \sqrt{10}\}$$

$$\{-1 + \sqrt{10} > 0\}$$

$$\{x = -2 + \sqrt{10}\}$$

$$\{-1 + \sqrt{10} > 0\}$$

$$\{x = -\sqrt{10}\}$$

$$\text{Отв: } -\sqrt{10}; -2 - \sqrt{10}; -2 + \sqrt{10}; \sqrt{10}$$

$$\{-1 - \sqrt{10}\}$$

$$\{x+1 = -1 - \sqrt{10}\}$$

$$\{-1 - \sqrt{10} > 0\}$$

$$\{x+1 = 1 + \sqrt{10}\}$$

$$\{x = -2 - \sqrt{10}\}$$

$$\{x = \sqrt{10}\}$$

$$2) (x + 3)^2 - |x + 3| - 30 = 0$$

$$|x+3|^2 - |x+3| - 30 = 0$$

$$t = |x+3|$$

$$t^2 - t - 30 = 0$$

$$t_1 = 6$$

$$t_2 = -5$$

$$|x+3| = 6$$

$$x+3 = 6$$

$$x+3 = -6$$

$$x = 3$$

$$x = -9$$

$$\text{Отв: } 3; -9$$

$$4) 4x^2 - 12x - 5|2x - 3| + 15 = 0$$

$$4x^2 - 12x + 9 - 9 + 15 - 5|2x - 3| = 0$$

$$(2x-3)^2 + 6 - 5|2x-3| = 0$$

$$|2x-3|^2 + 6 - 5|2x-3| = 0$$

$$t = |2x-3|$$

$$t^2 - 5t + 6 = 0$$

$$t_1 = 3$$

$$t_2 = 2$$

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

$$2x-3 = \pm 3$$

$$2x = 0$$

$$x = 0$$

$$2x = 6$$

$$x = 3$$

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

$$2x-3 = \pm 2$$

$$2x = 5$$

$$x = 2.5$$

$$2x = 1$$

$$x = 0.5$$

$$\text{Отв: } 0; 3; 2.5; 0.5$$



$$5) x^4 + 4x^3 = 30 - 7|x^2 + 2x| - 4x^2$$

$$x^2(x^2 + 4x + 4) = 30 - 7|x^2 + 2x|$$

$$x^2((x+2)^2) = 30 - 7|x(x + 2)|$$

$$(x(x+2))^2 = 30 - 7|x(x + 2)|$$

$$t = x(x+2)$$

$$t^2 = 30 - 7|t|$$

$$|t| = y$$

$$y^2 + 7y - 30 = 0$$

$$y_1 = -10$$

$$y_2 = 3$$

$$|t| = 3$$

$$\{3 > 0\}$$

$$\{|t| = 3\}$$

$$\{|t| = -3\}$$

$$t = 3$$

$$t = -3$$

$$x^2 + 2x - 3 = 0$$

$$x_1 = -3$$

$$x_2 = 1$$

$$x^2 + 2x + 3 = 0$$

корн нет

$$\text{Отв: } -3; 1$$