Задаци за вежбу

Решавање једначина применом формула за разлику квадрата и квадрат бинома

$$(A+B)^2 = A^2 + 2AB + B^2$$
$$(A-B)^2 = A^2 - 2AB + B^2$$
$$(A-B)(A+B) = A^2 - B^2$$

1. Реши једначину: $-3 \cdot (4x+3)(4x-3) - (2x+1)^2 + (3x-4)^2 + 43x^2 = 70.$
2. Реши једначину: $(4x+3)^2 - 3 \cdot (2+3x)(2-3x) - (1-3x)^2 - 34x^2 = 56.$
3. Реши једначину: $-2 \cdot (3x+2)(3x-2) - (4-3x)^2 + (3x+1)^2 + 18x^2 = 23.$
4. Реши једначину: $(2-3x)^2 - 2 \cdot (4-5x)(4+5x) - (3x+2)^2 - 50x^2 = -8.$
5. Реши једначину: $(3-4x)^2 - (2x+1)^2 - 3 \cdot (2x-5)(2x+5) = 111.$
6. Реши једначину: $(3+4x)^2 - (2x-1)^2 - 3 \cdot (2x-3)(2x+3) = 63.$
7. Реши једначину: $(2x+3)^2 - (3x-7)^2 + 5 \cdot (x-3)(x+3) = -31.$

Решења задатака:

1. $-3 \cdot (4x+3)(4x-3) - (2x+1)^2 + (3x-4)^2 + 43x^2 = 70.$
$-3 \cdot (16x^2 - 9) - (4x^2 + 2 \cdot 2x \cdot 1 + 1) + (9x^2 - 2 \cdot 3x \cdot 4 + 16) + 43x^2 = 70$
$-3 \cdot (16x^2 - 9) - (4x^2 + 4x + 1) + (9x^2 - 24x + 16) + 43x^2 = 70$
$-48x^2 + 27 - 4x^2 - 4x - 1 + 9x^2 - 24x + 16 + 43x^2 = 70$
$-48x^2 - 4x^2 + 9x^2 + 43x^2 - 4x - 24x + 27 - 1 + 16 = 70$
$-52x^2 + 52x^2 - 28x + 26 + 16 = 70$
$-28x + 42 = 70$
$-28x = 70 - 42$
$-28x = 28$
$x = 28 : (-28)$
$x = -1$

2. $(4x+3)^2 - 3 \cdot (2+3x)(2-3x) - (1-3x)^2 - 34x^2 = 56.$
$16x^2 + 2 \cdot 4x \cdot 3 + 9 - 3 \cdot (4 - 9x^2) - (1 - 2 \cdot 1 \cdot 3x + 9x^2) - 34x^2 = 56$
$16x^2 + 24x + 9 - 12 + 27x^2 - (1 - 6x + 9x^2) - 34x^2 = 56$
$16x^2 + 24x + 9 - 12 + 27x^2 - 1 + 6x - 9x^2 - 34x^2 = 56$
$16x^2 + 27x^2 - 9x^2 - 34x^2 + 24x + 6x + 9 - 12 - 1 = 56$
$43x^2 - 43x^2 + 30x - 3 - 1 = 56$
$+30x - 4 = 56$
$+30x = 56 + 4$
$+30x = 60$
$x = 60 : 30$
$x = 2$

3. $-2 \cdot (3x+2)(3x-2) - (4-3x)^2 + (3x+1)^2 + 18x^2 = 23$
$-2 \cdot (9x^2 - 4) - (16 - 2 \cdot 4 \cdot 3x + 9x^2) + (9x^2 + 2 \cdot 3x \cdot 1 + 1) + 18x^2 = 23$
$-18x^2 + 8 - (16 - 24x + 9x^2) + (9x^2 + 6x + 1) + 18x^2 = 23$
$-18x^2 + 8 - 16 + 24x - 9x^2 + 9x^2 + 6x + 1 + 18x^2 = 23$
$-18x^2 - 9x^2 + 9x^2 + 18x^2 + 24x + 6x + 8 - 16 + 1 = 23$
$-27x^2 + 27x^2 + 30x - 8 + 1 = 23$
$+30x - 7 = 23$
$+30x = 23 + 7$
$+30x = 30$

$x = 30:30$
$x = 1$

4. $(2-3x)^2 - 2\cdot(4-5x)(4+5x) - (3x+2)^2 - 50x^2 = -8$
$4 - 2\cdot 2\cdot 3x + 9x^2 - 2\cdot(16-25x^2) - (9x^2 + 2\cdot 3x\cdot 2 + 4) - 50x^2 = -8$
$4 - 12x + 9x^2 - 32 + 50x^2 - (9x^2 + 12x + 4) - 50x^2 = -8$
$4 - 12x + 9x^2 - 32 + 50x^2 - 9x^2 - 12x - 4 - 50x^2 = -8$
$+9x^2 + 50x^2 - 9x^2 - 50x^2 - 12x - 12x + 4 - 32 - 4 = -8$
$+59x^2 - 59x^2 - 24x - 28 - 4 = -8$
$-24x - 32 = -8$
$-24x = -8 + 32$
$-24x = +24$
$x = +24:(-24)$
$x = -1$

5. $(3-4x)^2 - (2x+1)^2 - 3\cdot(2x-5)(2x+5) = 111.$
$9 - 2\cdot 3\cdot 4x + 16x^2 - (4x^2 + 2\cdot 2x\cdot 1 + 1) - 3\cdot(4x^2 - 25) = 111$
$9 - 24x + 16x^2 - (4x^2 + 4x + 1) - 3\cdot(4x^2 - 25) = 111$
$9 - 24x + 16x^2 - 4x^2 - 4x - 1 - 12x^2 + 75 = 111$
$+16x^2 - 4x^2 - 12x^2 - 24x - 4x + 9 - 1 + 75 = 111$
$+12x^2 - 12x^2 - 28x + 8 + 75 = 111$
$-28x + 83 = 111$
$-28x = 111 - 83$
$-28x = 28$
$x = 28:(-28)$
$x = -1$

6. $(3+4x)^2 - (2x-1)^2 - 3\cdot(2x-3)(2x+3) = 63.$
$9 + 2\cdot 3\cdot 4x + 16x^2 - (4x^2 - 2\cdot 2x\cdot 1 + 1) - 3\cdot(4x^2 - 9) = 63$
$9 + 24x + 16x^2 - (4x^2 - 4x + 1) - 3\cdot(4x^2 - 9) = 63$
$9 + 24x + 16x^2 - 4x^2 + 4x - 1 - 12x^2 + 27 = 63$
$+16x^2 - 4x^2 - 12x^2 + 24x + 4x + 9 - 1 + 27 = 63$
$+12x^2 - 12x^2 + 28x + 8 + 27 = 63$
$+28x + 35 = 63$
$+28x = 63 - 35$
$+28x = 28$
$x = 28:(+28)$
$x = +1$
$x = 1$

7. $(2x+3)^2 - (3x-7)^2 + 5\cdot(x-3)(x+3) = -31.$
$4x^2 + 2\cdot 2x\cdot 3 + 9 - (9x^2 - 2\cdot 3x\cdot 7 + 49) + 5\cdot(x^2 - 9) = -31$
$4x^2 + 12x + 9 - (9x^2 - 42x + 49) + 5\cdot(x^2 - 9) = -31$
$4x^2 + 12x + 9 - 9x^2 + 42x - 49 + 5x^2 - 45 = -31$
$4x^2 - 9x^2 + 5x^2 + 12x + 42x + 9 - 49 - 45 = -31$
$-5x^2 + 5x^2 + 54x - 40 - 45 = -31$
$+54x - 85 = -31$
$+54x = -31 + 85$
$+54x = 54$

$x = 54 : 54$
$x = 1$