

## Radicals - Operations

### Adding/Subtracting radicals

#### Procedure

1. Take the  $n$ th root of each radical
2. Combine radicals with same radicands

### Multiplying radicals

#### Procedure

1. Treat radicals like variables in polynomials and multiply

Perform the indicated operations

1.  $3\sqrt{5} + 4\sqrt{5}$

2.  $4\sqrt{11} - 7\sqrt{11}$

3.  $4\sqrt{11} + 5\sqrt{2} - 7\sqrt{11} + 3\sqrt{2}$

4.  $3\sqrt{12} + 5\sqrt{20} - 8\sqrt{12} + 3\sqrt{20}$

5.  $3\sqrt{18} + 5\sqrt{90} - 8\sqrt{90} + 3\sqrt{8}$

6.  $(2\sqrt{3} + 1)(5\sqrt{6} + 2)$

7.  $(3\sqrt{5} - 1)(5\sqrt{7} + 2)$

8.  $(3\sqrt{5} + 2)^2$

9.  $(2\sqrt{3} - 7)^2$

10.  $(2\sqrt{3} - 7)(2\sqrt{3} + 7)$

11.  $(2\sqrt{5} + 1)(2\sqrt{5} - 1)$

12.  $(\sqrt{x} + 1)(\sqrt{x} - 1)$