



Assumption College Ubonratchathani  
English for Math 2

Name:..... Class:..... No. ....

**Adding and Subtracting Surds**

Formula 1:  $m\sqrt{a} + n\sqrt{a} = (m + n)\sqrt{a}$

Formula 2:  $m\sqrt{a} - n\sqrt{a} = (m - n)\sqrt{a}$



**Add or subtract and simplify.**

**Example 1:** Add/subtract and simplify

1.  $7\sqrt{5} + 3\sqrt{5} - 4\sqrt{5}$

Solution:  $7\sqrt{5} + 3\sqrt{5} - 4\sqrt{5} = (7 + 3 - 4)\sqrt{5} = 6\sqrt{5} \leftarrow \text{answer}$

1.  $6\sqrt{5} + 7\sqrt{5} + 2\sqrt{5}$

a.  $16\sqrt{5}$

b.  $13\sqrt{5}$

c.  $15\sqrt{5}$

2.  $8\sqrt{3} - 6\sqrt{3} + 2\sqrt{3}$

a.  $4\sqrt{3}$

b. 0

c.  $16\sqrt{3}$

3.  $6\sqrt{10} + 7\sqrt{10} - 9\sqrt{10}$

a.  $12\sqrt{10}$

b.  $4\sqrt{10}$

c.  $5\sqrt{10}$

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

a.  $12\sqrt{7}$

b.  $8\sqrt{7}$

c.  $7\sqrt{7}$

**Example 2:** Add/subtract and simplify

2.  $6\sqrt{2} + 7\sqrt{3} - 4\sqrt{2} + 2\sqrt{3}$

Solution:  $6\sqrt{2} - 4\sqrt{2} + 7\sqrt{3} + 2\sqrt{3} = 2\sqrt{2} + 9\sqrt{3} \leftarrow \text{answer}$

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

a.  $2\sqrt{2} - 5\sqrt{3}$

b.  $2\sqrt{2} + 5\sqrt{3}$

c.  $7\sqrt{2}$

6.  $3\sqrt{2} + 2\sqrt{3} - \sqrt{2} + 5\sqrt{3}$

a.  $\sqrt{2} + 7\sqrt{3}$

b.  $\sqrt{2} - 7\sqrt{3}$

c.  $11\sqrt{3}$

7.  $\sqrt{11} - 2\sqrt{6} + 2\sqrt{11} + 3\sqrt{6}$

a.  $9\sqrt{2} - 5\sqrt{6}$

b.  $3\sqrt{2} - \sqrt{6}$

c.  $4\sqrt{2} - 1\sqrt{6}$

**Example 3:** Add/subtract and simplify

3.  $2\sqrt{8} + 3\sqrt{18}$

Solution:  $\sqrt{8} + \sqrt{18} - \sqrt{16} = \sqrt{4 \times 2} + \sqrt{9 \times 2} - \sqrt{16 \times 2}$

$= 2\sqrt{2} + 3\sqrt{2} - 4\sqrt{2} = \sqrt{2} \leftarrow \text{answer}$

8.  $\sqrt{48} + \sqrt{12} - \sqrt{27}$

a.  $5\sqrt{3}$

b.  $3\sqrt{3}$

c.  $4\sqrt{3}$

**Example 4:** Add and simplify

3.  $2\sqrt{8} - 3\sqrt{18} + \sqrt{27}$

Solution:  $2\sqrt{8} - 3\sqrt{18} = 2\sqrt{4 \times 2} - 3\sqrt{9 \times 2} + \sqrt{9 \times 3}$   
 $= (2 \times 2\sqrt{2}) - (3 \times 3\sqrt{2}) + 3\sqrt{3}$   
 $= 4\sqrt{2} - 9\sqrt{2} + 3\sqrt{3}$   
 $= -5\sqrt{2} + 3\sqrt{3} \leftarrow \text{answer}$

9.  $\sqrt{8} + 3\sqrt{12} - \sqrt{27}$

a.  $5\sqrt{3}$

b.  $2\sqrt{2} + 3\sqrt{3}$

c.  $2\sqrt{3} + 3\sqrt{2}$

10.  $\sqrt{32} + \sqrt{27} - \sqrt{18} - \sqrt{12}$

a.  $\sqrt{2} + \sqrt{3}$

b.  $\sqrt{2} + 2\sqrt{3}$

c.  $3\sqrt{2} + 4\sqrt{3}$



*"Fall seven times and stand up eight."* – Japanese Proverb

("ล้มเจ็ดครั้งและลุกขึ้นแปดครั้ง" – สุภาษิตญี่ปุ่น)