



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)