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: $7\sqrt{5} + 3\sqrt{5} - 4\sqrt{5} = (7 + 3 - 4)\sqrt{5} = 6\sqrt{5}$ ← 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. $5\sqrt{10}$

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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: $6\sqrt{2} - 4\sqrt{2} + 7\sqrt{3} + 2\sqrt{3} = 2\sqrt{2} + 9\sqrt{3}$ ← 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: $\sqrt{8} + \sqrt{18} - \sqrt{16} = \sqrt{4 \times 2} + \sqrt{9 \times 2} - \sqrt{16 \times 2}$

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

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

a. $5\sqrt{3}$ b. $3\sqrt{3}$ c. $4\sqrt{3}$

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Example 4: Add and simplify

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

Solution: $2\sqrt{8} - 3\sqrt{18} = 2\sqrt{4 \text{ x } 2} - 3\sqrt{9 \text{ x } 2} + \sqrt{9 \text{ x } 3}$

$= (2 \text{ x } 2\sqrt{2}) - (3 \text{ x } 3\sqrt{2}) + 3\sqrt{3}$

$= 4\sqrt{2} - 9\sqrt{2} + 3\sqrt{3}$

$= -5\sqrt{2} + 3\sqrt{3}$ ← 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)

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