Adding and Subtracting Radicals Practice

Match the questions in column I with possible simplified answers in column II

I	II
1. $3\sqrt{8}+3\sqrt{2}$	A. $4\sqrt{5}$
2. $2\sqrt{54}-2\sqrt{24}$	B. $9\sqrt{2}$
3. $3\sqrt{20}-2\sqrt{5}$	C. $2\sqrt{5}+3\sqrt{3}$
4. $3\sqrt{18}-3\sqrt{3}-2\sqrt{12}$	D. $6\sqrt{2}-5\sqrt{3}$
5. $2\sqrt{5}+3\sqrt{3}$	E. $-5\sqrt{2}-\sqrt{6}$
6. $-\sqrt{18}-\sqrt{6}-\sqrt{8}$	F. $10\sqrt{6}$
	G. $2\sqrt{6}$
	H. $9\sqrt{2}-7\sqrt{3}$
	I. $-\sqrt{5}$

1. Write the correct letter (A – H) in the blank.
   a) Number 1 in column I is matched with ___.
   b) Number 2 in column I is matched with ___.
   c) Number 3 in column I is matched with ___.
   d) Number 4 in column I is matched with ___.
   e) Number 5 in column I is matched with ___.
   f) Number 6 in column I is matched with ___.

2. Given $12\sqrt{3}+m\sqrt{n}=14\sqrt{3}$, the values for m and n, respectively, are ___ and ___.

3. Which of the following radical expressions is already in simplest form?
   A) $-\sqrt{27}-5\sqrt{3}$
   B) $16\sqrt{6}+\sqrt{10}$
   C) $4\sqrt{50}-\sqrt{8}$
   D) $2\sqrt{8}+9\sqrt{2}$

Use the following information to answer the next question.

Amie was asked to simplify the following radical expression.

$$2\sqrt{20} + \sqrt{5} - 2\sqrt{6}$$

Analyze her work below.

Step 1	$(2)(4)\sqrt{5} + \sqrt{5} + 2\sqrt{6}$
Step 2	$8\sqrt{5} + \sqrt{5} + 2\sqrt{6}$
Step 3	$9\sqrt{5} + 2\sqrt{6}$
Step 4	$11\sqrt{11}$

4. Identify two specific errors that Amie made in her work.

Adding and Subtracting Radicals PracticeSolutions

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1. $3\sqrt{8}+3\sqrt{2}$	A. $4\sqrt{5}$
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6. $-\sqrt{18}-\sqrt{6}-\sqrt{8}$	F. $10\sqrt{6}$
	G. $2\sqrt{6}$
	H. $9\sqrt{2}-7\sqrt{3}$
	I. $-\sqrt{5}$

1. Write the correct letter (A – H) in the blank.

a) Number 1 in column I is matched with _B_.

b) Number 2 in column I is matched with _G_.

c) Number 3 in column I is matched with _A_.

d) Number 4 in column I is matched with _H_.

e) Number 5 in column I is matched with _C_.

f) Number 6 in column I is matched with _E_.

Solution

Expression 1

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

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

= $3(2)\sqrt{2}+3\sqrt{2}$

= $6\sqrt{2}+3\sqrt{2}$

= $9\sqrt{2}$ **Number 1 in column I is matched with _B_.**

Expression 2

$2\sqrt{54} - 2\sqrt{24}$

= $2\sqrt{9}\sqrt{6} - 2\sqrt{4}\sqrt{6}$

= $2(3)\sqrt{6} - 2(2)\sqrt{6}$

= $6\sqrt{6} - 4\sqrt{6}$

= $2\sqrt{6}$ **Number 2 in column I is matched with _G_.**

Expression 3

$3\sqrt{20} - 2\sqrt{5}$

= $3\sqrt{4}\sqrt{5} - 2\sqrt{5}$

= $3(2)\sqrt{5} - 2\sqrt{5}$

= $6\sqrt{5} - 2\sqrt{5}$

= $4\sqrt{5}$ **Number 3 in column I is matched with _A_.**

Expression 4

$3\sqrt{18} - 3\sqrt{3} - 2\sqrt{12}$

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

= $3(3)\sqrt{2} - 3\sqrt{3} - 2(2)\sqrt{3}$

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

= $9\sqrt{2} - 7\sqrt{3}$ **Number 4 in column I is matched with _H_.**

Expression 5

Expression 5 is simplified as much as possible.

$2\sqrt{5}+3\sqrt{3}$ = $2\sqrt{5}+3\sqrt{3}$

Number 5 in column I is matched with _C_.

Expression 6

$-\sqrt{18}-\sqrt{6}-\sqrt{8}$

= $-\sqrt{9}\sqrt{2}-\sqrt{6}-\sqrt{4}\sqrt{2}$

= $-(3)\sqrt{2}-\sqrt{6}-(2)\sqrt{2}$

= $-5\sqrt{2}-\sqrt{6}$ **Number 6 in column I is matched with _E_.**

2. Given $12\sqrt{3}+m\sqrt{n}=14\sqrt{3}$, the values for m and n, respectively, are _2__ and _3__.

Solution

In order to add two radicals, they must be like. The radicands must be the same. Since the radicand in the first term is 3, the radicand (n) must also be 3.

To get 14 as a coefficient in the simplified term on the right of the equal sign, 12 must be added to (m) to get 14. Thus, m is 2.

3. Which of the following radical expressions is already in simplest form?

A) $-\sqrt{27}-5\sqrt{3}$

B) $16\sqrt{6}+\sqrt{10}$ Answer

C) $4\sqrt{50}-\sqrt{8}$

D) $2\sqrt{8}+9\sqrt{2}$

Solution

The correct answer is B. For all the other choices, there is at least 1 radicand that has a factor that is the same as a radicand for a perfect square.

Use the following information to answer the next question.

Amie was asked to simplify the following radical expression.

$$2\sqrt{20}+\sqrt{5}-2\sqrt{6}$$

Analyze her work below.

Step 1	$(2)(4)\sqrt{5}+\sqrt{5}+2\sqrt{6}$
Step 2	$8\sqrt{5}+\sqrt{5}+2\sqrt{6}$
Step 3	$9\sqrt{5}+2\sqrt{6}$
Step 4	$11\sqrt{11}$

4. Identify two specific errors that Amie made in her work.

Solution

In step one, the 4 in front of root 5 should be the square root of 4.

$(2)(4)\sqrt{5}+\sqrt{5}+2\sqrt{6}$

It should be $\sqrt{4}$. The equivalent of $\sqrt{20}$ is $\sqrt{4}X\sqrt{5}$.

In step 4, the radicals are incorrectly added. They cannot be combined since the radicals are not like. Step 4 should be the same as step 3.