Name _____ Date _____ Class _____

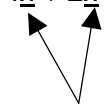
LESSON 11-7

Review for Mastery

Adding and Subtracting Radical Expressions

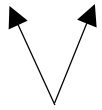
You can add and subtract radical expressions just like you add and subtract expressions with variables.

$4x + 2x = 6x$



These are like terms. Add.

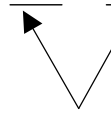
$2x + 4y$



These are not like terms. Do not add.

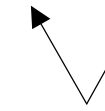
Combine radicals only if they are like radicals.

$4\sqrt{7} + 2\sqrt{7} = 6\sqrt{7}$



These are like radicals. Add.

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



These are not like radicals. Do not add.

Add $8\sqrt{10} + 5\sqrt{10}$.

$8\sqrt{10} + 5\sqrt{10}$

$13\sqrt{10}$

These are like radicals.

Subtract $10\sqrt{7x} - 12\sqrt{7x}$.

$10\sqrt{7x} - 12\sqrt{7x}$

$-2\sqrt{7x}$

These are like radicals.

Add $4\sqrt{2} + 8\sqrt{3}$.

$4\sqrt{2} + 8\sqrt{3}$

These are not like radicals. Do not add.

Add $9\sqrt{5} - 4\sqrt{6}$.

$9\sqrt{5} - 4\sqrt{6}$

These are not like radicals. Do not subtract.

State whether the expressions can be added. If yes, find the sum.

1. $3\sqrt{2y} + 8\sqrt{2y}$

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

3. $8 + \sqrt{8}$

4. $5\sqrt{11} - 6\sqrt{11}$

Add or subtract.

5. $4\sqrt{13} + 2\sqrt{13}$

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

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

8. $12\sqrt{3a} - 2\sqrt{3a}$

9. $7\sqrt{x} + \sqrt{x}$

10. $10\sqrt{6} - 3\sqrt{6}$

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LESSON 11-7

Review for Mastery

Adding and Subtracting Radical Expressions continued

Sometimes it is necessary to simplify expressions before adding or subtracting.

Simplify $\sqrt{50} + \sqrt{18}$.

$\sqrt{50} + \sqrt{18}$

$\sqrt{25 \cdot 2} + \sqrt{9 \cdot 2}$ *Factor the radicands using perfect squares.*

$\sqrt{25} \cdot \sqrt{2} + \sqrt{9} \cdot \sqrt{2}$ *Product Property*

$5\sqrt{2} + 3\sqrt{2}$ *Simplify.*

$8\sqrt{2}$ *Combine like radicals.*

Simplify $\sqrt{45a} + \sqrt{80a} - \sqrt{20}$.

$\sqrt{9 \cdot 5a} + \sqrt{16 \cdot 5a} - \sqrt{4 \cdot 5}$ *Factor the radicands using perfect squares.*

$\sqrt{9} \cdot \sqrt{5a} + \sqrt{16} \cdot \sqrt{5a} - \sqrt{4} \cdot \sqrt{5}$ *Product Property*

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

$7\sqrt{5a} - 2\sqrt{5}$ *Combine like radicals.*

Notice that $\sqrt{5a}$ and $\sqrt{5}$ are not like radicals.

Simplify each expression by filling in the boxes below.

11. $\sqrt{32} + \sqrt{2}$

$\sqrt{\square \cdot \square} + \sqrt{2}$

$\sqrt{\square}\sqrt{\square} + \sqrt{2}$

$\square\sqrt{\square} + \sqrt{2}$

$\square\sqrt{\square}$

12. $\sqrt{27} - \sqrt{3}$

$\sqrt{\square \cdot \square} + \sqrt{3}$

$\sqrt{\square}\sqrt{\square} + \sqrt{3}$

$\square\sqrt{\square} + \sqrt{3}$

$\square\sqrt{\square}$

13. $\sqrt{125} + \sqrt{5}$

$\sqrt{\square \cdot \square} + \sqrt{5}$

$\sqrt{\square}\sqrt{\square} + \sqrt{5}$

$\square\sqrt{\square} + \sqrt{5}$

$\square\sqrt{\square}$

Simplify.

14. $\sqrt{12} + \sqrt{300}$

15. $\sqrt{48} - \sqrt{27}$

16. $\sqrt{112} + \sqrt{14}$

17. $\sqrt{75} + \sqrt{12} - \sqrt{27}$

18. $\sqrt{63x} + \sqrt{28x} - \sqrt{7x}$

19. $\sqrt{160y} - \sqrt{90y} - \sqrt{40y}$

LESSON 11–7

Practice A

1. 8
2. -2
3. 13; $\sqrt{m}$
4. $\sqrt{7}+6\sqrt{13}$
5. $4\sqrt{10}$
6. $6\sqrt{2b}-4\sqrt{b}$
7. 5; 4; 9
8. 9; 64; 9; 64; 3; 8; 11
9. 4; 16; 5; 4; 16; 5; 2; 4; 5
10. $8\sqrt{7}$
11. $7\sqrt{3}$
12. $5\sqrt{11}$
13. $9\sqrt{2}+4\sqrt{3}$
14. $4\sqrt{5}+10\sqrt{2}$
15. $10\sqrt{3}$
16. $10\sqrt{2}+5\sqrt{3}$
17. $-3\sqrt{5}+9\sqrt{2}$
18. $8\sqrt{6}$
19. $9\sqrt{x}$
20. $12x\sqrt{3}$
21. $16\sqrt{3t}$
22. $21\sqrt{m}$ in.
23. $14\sqrt{2}$ m

Practice B

1. 13
2. -8
3. $10\sqrt{y}$
4. $8\sqrt{3b}$
5. $6\sqrt{15}$
6. $\sqrt{2}-3\sqrt{2x}$
7. $11\sqrt{3}$
8. $12\sqrt{7}$
9. $5\sqrt{7x}$
10. $9\sqrt{5}$
11. $-8\sqrt{13}$
12. $23\sqrt{2}$
13. $12\sqrt{2}$
14. $13\sqrt{3}$
15. $3\sqrt{42}$
16. $5\sqrt{17}+17\sqrt{5}$
17. $16\sqrt{3}$
18. $\sqrt{3b}$
19. $6\sqrt{3m}$
20. $11\sqrt{2m}$
21. $\sqrt{z}+4\sqrt{2z}$
22. $10\sqrt{6t}$
23. $11\sqrt{13x}-2\sqrt{13}$
24. $12\sqrt{6k}+12\sqrt{5}$
25. $4\sqrt{2}$, $\sqrt{50}$, $3\sqrt{8}$
26. $5+8\sqrt{7}$ miles

Practice C

1. $10\sqrt{3}$
2. $5\sqrt{t}$
3. $11\sqrt{11}+2\sqrt{5}$
4. $6\sqrt{3}$
5. $4\sqrt{2}$
6. $3\sqrt{3}$
7. $17\sqrt{3}$
8. $18\sqrt{2}$
9. $5\sqrt{15}$
10. $26\sqrt{2}$
11. $8-14\sqrt{3}$
12. $14\sqrt{5}$
13. $\sqrt{3}+\sqrt{5}$
14. $\frac{5\sqrt{6}}{2}$
15. $\frac{11\sqrt{2}}{3}$
16. $11\sqrt{2b}-4\sqrt{b}$
17. $23\sqrt{2t}$
18. $6\sqrt{3ab}-4\sqrt{ab}$
19. $7\sqrt{5xyz}$
20. $-\frac{45\sqrt{11}}{2}$
21. $13\sqrt{5z}-\sqrt{z}$
22. a. $5\sqrt{2}$ units
    b. $6\sqrt{2}$ units
    c. $11\sqrt{2}$ units

Review for Mastery

1. yes; $11\sqrt{2y}$
2. no
3. no
4. yes; $-\sqrt{11}$
5. $6\sqrt{13}$
6. $5\sqrt{2}$
7. $11\sqrt{5}$
8. $10\sqrt{3a}$
9. $8\sqrt{x}$
10. $7\sqrt{6}$
11. $\sqrt{16\cdot 2}$; $\sqrt{16}\ \sqrt{2}$; $4\sqrt{2}$; $5\sqrt{2}$
12. $\sqrt{9\cdot 3}$; $\sqrt{9}\ \sqrt{3}$; $3\sqrt{3}$; $4\sqrt{3}$
13. $\sqrt{25\cdot 5}$; $\sqrt{25}\ \sqrt{5}$; $5\sqrt{5}$; $6\sqrt{5}$
14. $12\sqrt{3}$
15. $\sqrt{3}$
16. $4\sqrt{7}+\sqrt{14}$
17. $4\sqrt{3}$
18. $4\sqrt{7x}$
19. $-\sqrt{10y}$

Problem Solving

1. $12\sqrt{5}$ ft
2. $6\sqrt{6}+8\sqrt{3}$ ft
3. $11\sqrt{3}+9\sqrt{5}$ lbs
4. $10\sqrt{30}+16$ ft
5. D
6. H
7. D
8. H