Operations with Radicals

Joke Worksheet

Adding, Subtracting, Multiplying and Dividing Radicals

Operations with Radicals

- Students will complete 18 problems practicing adding/subtracting, multiplying and dividing radicals. As students finish a problem, they will match their answer to one in the answer bank. Then they will put whatever letter is next to their answer in the numbered box to complete the puzzle and answer the riddle.

- Skills required:
  - Simplifying Radicals
  - Adding & Subtracting Radicals
  - Multiplying Radicals
  - Dividing/Rationalizing the denominator (all the way up to binomial/binomial.)

Name: _____   Date:_____

What did the ocean say to the iceberg?

Directions: Complete each problem on operations with radicals and find your solution in the box below. Write the letter of your solution in the problem number's box at the bottom of the page to determine the answer to the riddle.

Adding & Subtracting Radicals	
1. $3\sqrt{5} - 2\sqrt{20} + 3\sqrt{20}$	2. $3\sqrt[3]{-162} - 3\sqrt[3]{6} - 3\sqrt[3]{48}$
3. $-2xy^2\sqrt{45xy^2} + 2\sqrt[3]{5x^7y^8} - 2\sqrt{45x^3y^6}$	
4. $-2x^4y\sqrt{16y^{13}} - 2\sqrt[3]{16x^{12}y^{16}} - x^2y^3\sqrt[3]{-54x^6y^7}$	
5. $-2\sqrt[6]{320} - 3\sqrt[5]{192} + 3\sqrt[5]{192}$	6. $-y\sqrt[4]{64x^9} - 2\sqrt[4]{64x^9y^4} + 3xy\sqrt{4x^3}$
Multiplying Radicals	
7. $-2\sqrt{3}(3\sqrt{2} + \sqrt{6})$	8. $-\sqrt{3x}(4x + x\sqrt{2x})$
9. $(\sqrt{2} - 3)(3\sqrt{2} - 1)$	10. $(-2\sqrt{5} + 2)(4\sqrt{5} + 4)$
11. $(4\sqrt{5n} + 3\sqrt{3})(\sqrt{5n} + 3\sqrt{3n})$	12. $(\sqrt{3r} + 2)(\sqrt{3} - 3)$

Dividing Radicals		
13. $\dfrac{5\sqrt{3}}{\sqrt{5}}$	14. $\dfrac{2 - \sqrt{3}}{\sqrt{20}}$	15. $\dfrac{2\sqrt{5} + \sqrt{3}}{\sqrt{8}}$
16. $\dfrac{3}{3 + \sqrt{5}}$	17. $\dfrac{-4 - 3\sqrt{2}}{2 + \sqrt{2}}$	18. $\dfrac{\sqrt{2} - \sqrt{5}}{3 - \sqrt{3}}$

Answers:

T	$20n + 12n\sqrt{15} + 3\sqrt{15n} + 27\sqrt{n}$	G	$-8x^4y^7\sqrt{y} - x^4y^5\sqrt[3]{2y}$	L	-36
N	-32	E	$\sqrt{15}$	E	$\sqrt[6]{5}$
O	$\dfrac{9 - 3\sqrt{5}}{4}$	S	$\dfrac{2\sqrt{5} + 3\sqrt{6}}{4}$	W	$5\sqrt{5}$
J	$\dfrac{2\sqrt{5} - \sqrt{15}}{10}$	S	$\dfrac{\sqrt{10} - 2\sqrt{6}}{3}$	D	$-1 - \sqrt{2}$
U	$\dfrac{3\sqrt{2} + \sqrt{6} - 3\sqrt{5} - \sqrt{15}}{6}$	V	$\dfrac{2\sqrt{10} + \sqrt{6}}{4}$	A	$\dfrac{\sqrt{3} + \sqrt{2}}{6}$
I	$-18\sqrt[3]{6}$	S	$-4x\sqrt{3x} - x^2\sqrt{6}$	Y	$3 - \sqrt{5}$
I	$-12xy^3\sqrt{5x} + 2x^2y^2\sqrt[3]{5xy^2}$	T	$-6\sqrt{6} - 6\sqrt{2}$	N	$9 - 10\sqrt{2}$
T	$-6x^2y\sqrt[4]{4x} + 6x^2y\sqrt{x}$	A	$3\sqrt{r} - 3\sqrt{3r} + 2\sqrt{3} - 6$	H	$-4\sqrt[6]{5}$

9	16	7	5	3	10	4	2	11	14	18	8	6	1	12	15	13	17

Answer Key

#	Letter	Answer
1	W	$5\sqrt{5}$
2	I	$-18\sqrt[3]{6}$
3	I	$-12xy^3\sqrt{5x} + 2x^2y^2\sqrt[3]{5xy^2}$
4	G	$-8x^4y^7\sqrt{y} - x^4y^5\sqrt[3]{2y}$
5	H	$-4\sqrt[6]{5}$
6	T	$-6x^2y\sqrt[4]{4x} + 6x^2y\sqrt{4x}$
7	T	$-6\sqrt{6} - 6\sqrt{2}$
8	S	$-4x\sqrt{3x} - x^2\sqrt{6}$
9	N	$9 - 10\sqrt{2}$
10	N	-32
11	T	$20n + 12n\sqrt{15} + 3\sqrt{15n} + 27\sqrt{n}$
12	A	$3\sqrt{r} - 3\sqrt{3r} + 2\sqrt{3} - 6$
13	E	$\sqrt{15}$
14	J	$\dfrac{2\sqrt{5} - \sqrt{15}}{10}$
15	V	$\dfrac{2\sqrt{10} + \sqrt{6}}{4}$
16	O	$\dfrac{9 - 3\sqrt{5}}{4}$
17	D	$-1 - \sqrt{2}$
18	U	$\dfrac{3\sqrt{2} + \sqrt{6} - 3\sqrt{5} - \sqrt{15}}{6}$

9	16	7	5	3	10	4	2	11	14	18	8	6	1	12	15	13	17
N	O	T	H	I	N	G	I	T	J	U	S	T	W	A	V	E	D

Thank you!!

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QUESTIONS OR SPECIAL REQUESTS? I WOULD LOVE TO HEAR FROM YOU! Just send me an email: huttonmath@gmail.com

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