Algebra Unit 4 Review

Brain Dump: List the first 15 perfect squares:

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225

Multiplying Radicals – RULE

1. Multiply the outside together.
2. Multiply the inside together.
3. Simplify the radical.

Adding/Subtracting Radicals – RULE

1. Simplify all radicals
2. Then add/subtract the like radicals

Simplify Practice: Answer the following.

a. $\sqrt{25}$

5

b. $\sqrt{49}$

7

c. $\sqrt{100}$

10

d. $\sqrt{18}$

$\sqrt{9 \cdot 2}$

$3\sqrt{2}$

e. $\sqrt{63}$

$\sqrt{9 \cdot 7}$

$3\sqrt{7}$

f. $5\sqrt{12x^6y^5z^4}$

$5\sqrt{4 \cdot 3}$

$10x^3y^2z^2\sqrt{3y}$

g. $\sqrt{48}$

$\sqrt{16 \cdot 3}$

$4\sqrt{3}$

h. $\sqrt{24x^2y^8}$

$\sqrt{4 \cdot 6\ xx\ yyyyyyyy}$

$2xy^4\sqrt{6}$

i. $\sqrt{14}$

$\sqrt{14}$

j. $3\sqrt{96w^2x^2}$

$3\sqrt{16 \cdot 6\ ww\ xx}$

$12wx\sqrt{6}$

k. $4\sqrt{20}$

$4\sqrt{4 \cdot 5}$

$8\sqrt{5}$

l. $6\sqrt{120xy^3}$

$6\sqrt{4\ 30x\ yy\ y}$

$12y\sqrt{30xy}$

m. $2\sqrt{36}$

$2 \cdot 6$

12

Multiply Practice: Multiply the following radicals. Make sure they are in simplest form.

a. $\sqrt{2} \cdot \sqrt{18}$

$\sqrt{36}$

6

b. $\sqrt{5} \cdot \sqrt{10}$

$\sqrt{50}$

$\sqrt{25 \cdot 2}$

$5\sqrt{2}$

c. $\sqrt{8} \bullet \sqrt{32}$

$\sqrt{256}$

16

d. $\sqrt{2y^3} \cdot \sqrt{8y^3}$

$\sqrt{16y^6}$

$4y^3$

e. $\sqrt{18a^2} \cdot 4\sqrt{3a^3}$

$4\sqrt{54a^5}$

$4\sqrt{9 \cdot 6\ aaaaa}$

$12a^2\sqrt{6a}$

f. $3\sqrt{4m^2} \cdot -2\sqrt{10m^8}$

$-6\sqrt{40m^{10}}$

$-6\sqrt{4 \cdot 10\ m^{10}}$

$-12m^5\sqrt{10}$

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Add/Subtract Practice: Add or Subtract the following radicals. Make sure they are in simplest form.

a. $2\sqrt{5}+6\sqrt{5}$

~~$5\sqrt{8}$~~

$8\sqrt{5}$

b. $3\sqrt{7}+2\sqrt{7}$

$5\sqrt{7}$

c. $4\sqrt{15}-6\sqrt{15}$

$-2\sqrt{15}$

d. $6\sqrt{7}+8\sqrt{10}-3\sqrt{7}$

$3\sqrt{7}+8\sqrt{10}$

e. $11\sqrt{5}-2\sqrt{20}$

$-2\sqrt{4\cdot5}$

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

$7\sqrt{5}$

f. $3\sqrt{3}+6\sqrt{27}$

$6\sqrt{9\cdot3}$

$3\sqrt{3}+18\sqrt{3}$

$21\sqrt{3}$

g. $3\sqrt{5}+2\sqrt{500}$

$3\sqrt{5}\ \ 2\sqrt{100\cdot5}$

$3\sqrt{5}+20\sqrt{5}$

$23\sqrt{5}$

h. $3\sqrt{3}-2\sqrt{12}$

$-2\sqrt{4\cdot3}$

$3\sqrt{3}-4\sqrt{3}$

$-1\sqrt{3}$

i. $12\sqrt{50}+6\sqrt{2}$

$12\sqrt{25\cdot2}$

$60\sqrt{2}+6\sqrt{2}$

$66\sqrt{2}$

Putting It All Together: Put together everything you have learned about radicals.

a. $\sqrt{12}(\sqrt{9}-\sqrt{4})$

$\sqrt{12}(3-2)$

$\sqrt{12}(1)$

$\sqrt{12}$

b. $\sqrt{3}\left(\sqrt{3}+2\sqrt{5}\right)$

$\sqrt{9}+2\sqrt{15}$

$3+2\sqrt{15}$

c. $\sqrt{5}(\sqrt{10}-\sqrt{15})$

$\sqrt{50}-\sqrt{75}$

$\sqrt{25\cdot2}-\sqrt{25\cdot3}$

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

d. $-\sqrt{5}\left(\sqrt{10}+3\right)$

$-\sqrt{50}-3\sqrt{5}$

$-\sqrt{25\cdot2}$

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

e. $5\sqrt{6}\left(\sqrt{6}+4\sqrt{5}\right)$

$5\sqrt{36}+20\sqrt{30}$

$5\cdot6$

$30+20\sqrt{30}$

f. $-3\sqrt{3}\left(4\sqrt{6}-2\sqrt{2}\right)$

$-12\sqrt{18}+6\sqrt{6}$

$-12\sqrt{9\cdot2}$

$-36\sqrt{2}+6\sqrt{6}$

Algebra Unit 4 Review

Rational vs Irrational: Classify each number as rational or irrational and explain why.

a. $\sqrt{15}$

I

b. ¼

R

c. $\sqrt{2}\cdot\sqrt{18}$

$\sqrt{36}$

R

d. $\sqrt{25}+\sqrt{1}$ $=6$

R

e. $\sqrt{7}+\sqrt{28}$

$\sqrt{4\cdot7}$

$\sqrt{7}+2\sqrt{7}$

$3\sqrt{7}$

I

f. $\pi+(-\pi)$ $=0$

R

g. $\sqrt{6}\,(2+5)$

$7\sqrt{6}$

I

h. $\sqrt{2}(\sqrt{18}+\sqrt{8})$

$\sqrt{36}+\sqrt{16}$

$6+4$

10

R

i. $4(\sqrt{9}+\sqrt{2})$

$4\sqrt{9}+4\sqrt{2}$

$12+4\sqrt{2}$

I

Critical Thinking:

Let the following variables represent a certain type of number:

A = 5 **B** = -5 **C** = $\sqrt{9}$

D = $\sqrt{6}$ **E** = $\sqrt{6}$ **F** = $\sqrt{25}$

Determine if the following sums or products will result in a rational or irrational number.

a. A + B

$5+-5=0$

R

b. A + C

$5+\sqrt{9}$

$5+3$

8

R

c. C + D

$\sqrt{9}+\sqrt{6}$

$3+\sqrt{6}$

I

d. C + F

$\sqrt{9}+\sqrt{25}$

$3+5$

8

R

e. A x B

$5\cdot-5$

-25

R

f. B x C

$-5\sqrt{9}$

-15

R

g. C x D

$\sqrt{9}\cdot\sqrt{6}$

$3\sqrt{6}$

I

h. C x C

$\sqrt{9}\cdot\sqrt{9}$

9

R

i. D + E

$\sqrt{6}+\sqrt{6}$

$2\sqrt{6}$

I

j. D x E

$\sqrt{6}\,\sqrt{6}$

6

R

k. E + F

$\sqrt{6}+\sqrt{25}$

$\sqrt{6}+5$

I

l. B + F

$-5+\sqrt{25}$

$-5+5$

0

R

Algebra Unit 4 Review

Polynomial Operations: Simplify the following completely.

a. $(4x+3x^2-7)+(-6x^2+4)$

$-3x^2+4x-3$

b. $(4x^2-3x-2)-(9x^2+3x-7)$

$4x^2-3x-2-9x^2-3x+7$

$-5x^2-6x+5$

c. $(5x-x^2)+(-2x^2+2x-9)$

$-3x^2+7x-9$

d. $(-4x-2x^2-6)-(-2x^2+8x-6)$

$-4x\cancel{-2x^2}-6+\cancel{2x^2}-8x+6$

$-12x$

e. $5x(3x+7)$

$15x^2+35x$

f. $(x+4)(x-9)$

$x^2-5x-36$

g. $(2x+3)(-3x-4)$

	$-3x$	-4
$2x$	$-6x^2$	$-8x$
3	$-9x$	-12

$-6x^2-17x-12$

h. $(-5x+9)(-2x-9)$

	$-2x$	-9
$-5x$	$10x^2$	$45x$
9	$-18x$	-81

$10x^2+27x-81$

i. $(x+1)(x+8)(x-6)$

	x	8
x	x^2	$8x$
1	$1x$	8

x^2+9x+8

x	x^3	$9x^2$	$8x$
-6	$-6x^2$	$-54x$	-48

$x^3+3x^2-46x-48$

j. $(x-4)(x+4)(x-5)$

$(x^2-16)(x-5)$

	x	-5
x^2	x^3	$-5x^2$
-16	$-16x$	80

$x^3-5x^2-16x+80$

k. $(x-5)^2$

	x	-5
x	x^2	$-5x$
-5	$-5x$	25

$x^2-10x+25$

l. $(x+7)^3$ $(x+7)(x+7)$

$(x^2+14x+49)(x+7)$

	x^2	$14x$	49
x	x^3	$14x^2$	$49x$
7	$7x^2$	$98x$	343

$x^3+21x^2+147x+343$