EMA

Square Roots and Simplifying

Name: KEY

Date: _____ Period: _____

mplete the table.

$\sqrt{1} = 1$	$\sqrt{49} = 7$	$\sqrt{169} = 13$	$\sqrt{361} = 19$
$\sqrt{4} = 2$	$\sqrt{64} = 8$	$\sqrt{196} = 14$	$\sqrt{400} = 20$
$\sqrt{9} = 3$	$\sqrt{81} = 9$	$\sqrt{225} = 15$	$\sqrt{441} = 21$
$\sqrt{16} = 4$	$\sqrt{100} = 10$	$\sqrt{256} = 16$	$\sqrt{484} = 22$
$\sqrt{25} = 5$	$\sqrt{121} = 11$	$\sqrt{289} = 17$	$\sqrt{576} = 24$
$\sqrt{36} = 6$	$\sqrt{144} = 12$	$\sqrt{324} = 18$	$\sqrt{625} = 25$

Simplify each radical. No Decimals.

1.) $\sqrt{48} = \sqrt{16}\cdot\sqrt{3}$

$= 4\sqrt{3}$

2.) $\sqrt{56} = \sqrt{4}\cdot\sqrt{14}$

$= 2\sqrt{14}$

3.) $\sqrt{72} = \sqrt{36}\cdot\sqrt{2}$

$= 6\sqrt{2}$

4.) $\sqrt{36} = 6$

5.) $\sqrt{242} = \sqrt{121}\cdot\sqrt{2}$

$= 11\sqrt{2}$

6.) $\sqrt{250} = \sqrt{25}\cdot\sqrt{10}$

$= 5\sqrt{10}$

7.) $\sqrt{200} = \sqrt{100}\cdot\sqrt{2}$

$= 10\sqrt{2}$

8.) $\sqrt{32} = \sqrt{16}\cdot\sqrt{2}$

$= 4\sqrt{2}$

9.) $\sqrt{20x^4y^3} = \sqrt{4x^4y^2}\cdot\sqrt{5y}$

$= 2x^2y\sqrt{5y}$

10.) $\sqrt{125m^3n^5} = \sqrt{25m^2n^4}\cdot\sqrt{5mn}$

$= 5mn^2\sqrt{5mn}$

11.) $\sqrt{300a^2b^7c^{10}}$

$= \sqrt{100a^2b^6c^{10}}\cdot\sqrt{3b}$

$= 10ab^3c^5\sqrt{3b}$

12.) $\sqrt{16xy^3z} = \sqrt{16y^2}\cdot\sqrt{xyz}$

$= 4y\sqrt{xyz}$

13.) $\sqrt{8a^5b^7c^9} = \sqrt{4a^4b^6c^8}\cdot\sqrt{2abc}$

$= 2a^2b^3c^4\sqrt{2abc}$

14.) $\sqrt{33a^2b^5c^3}$

$= \sqrt{a^2b^4c^2}\cdot\sqrt{33bc}$

$= ab^2c\sqrt{33bc}$

Simplify.

15.) $5\sqrt{2} + 7\sqrt{2}$

$= 12\sqrt{2}$

16.) $3\sqrt{5} + 4\sqrt{3} - 6\sqrt{5}$

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

17.) $2\sqrt{8} - 4\sqrt{2}$

$= 2\sqrt{4}\cdot\sqrt{2} - 4\sqrt{2}$

$= 2\cdot 2\sqrt{2} - 4\sqrt{2}$

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

$= 0$

18.) $2\sqrt{2x^3} - x\sqrt{32x}$

$= 2\sqrt{x^2}\sqrt{2x} - x\sqrt{16}\sqrt{2x}$

$= 2x\sqrt{2x} - 4x\sqrt{2x}$

$= -2x\sqrt{2x}$

19.) $-2\sqrt{45} - 3\sqrt{20} - 2\sqrt{12}$

$= -2\sqrt{9}\cdot\sqrt{5} - 3\sqrt{4}\sqrt{5} - 2\sqrt{4}\sqrt{3}$

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

$= -6\sqrt{5} - 6\sqrt{5} - 4\sqrt{3}$

$= -12\sqrt{5} - 4\sqrt{3}$

20.) $\sqrt{45x^6y^3} - \sqrt{20x^3y^2}$

$= \sqrt{9x^6y^2}\sqrt{5y} - \sqrt{4x^2y^2}\sqrt{5x}$

$= 3x^2y\sqrt{5y} - 2xy\sqrt{5x}$

21.) $\sqrt{24x^4} - x^3\sqrt{75x} + x\sqrt{108x^3}$

$= \sqrt{4x^4}\sqrt{6} - x^3\sqrt{25}\sqrt{3x} + x\sqrt{36x^2}\sqrt{3x}$

$= 2x^2\sqrt{6} - 5x^3\sqrt{3x} + 6x^3\sqrt{3x}$

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

22.) $\sqrt{80m^5n^3} - m^2\sqrt{150mn^3}$

$= \sqrt{16m^4n^2}\sqrt{5mn} - m^2\sqrt{25n^2}\sqrt{6mn}$

$= 4m^2n\sqrt{5mn} - 5m^2n\sqrt{6mn}$

23.) $\sqrt{3}(2 - \sqrt{8})$

$= 2\sqrt{3} - \sqrt{24}$

$= 2\sqrt{3} - \sqrt{4}\cdot\sqrt{6}$

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

24.) $\sqrt{6x}(\sqrt{3x^3} - 6)$

$= \sqrt{18x^4} - 6\sqrt{6x}$

$= \sqrt{9x^4}\cdot\sqrt{2} - 6\sqrt{6x}$

$= 3x^2\sqrt{2} - 6\sqrt{6x}$

25.) $3\sqrt{2}(\sqrt{6} + \sqrt{2})$

$= 3\sqrt{12} + 3\sqrt{4}$

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

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

$= 6\sqrt{3} + 6$

27.) $(2 + \sqrt{8})(4 - \sqrt{3})$

$= 8 - 2\sqrt{3} + 4\sqrt{8} - \sqrt{24}$

$= 8 - 2\sqrt{3} + 4\sqrt{4}\cdot\sqrt{2} - \sqrt{4}\cdot\sqrt{6}$

$= 8 - 2\sqrt{3} + 4\cdot 2\sqrt{2} - 2\sqrt{6}$

$= 8 - 2\sqrt{3} + 8\sqrt{2} - 2\sqrt{6}$

28.) $(4 - \sqrt{2})(4 + \sqrt{2})$

$= 16 + 4\sqrt{2} - 4\sqrt{2} - \sqrt{4}$

$= 16 - \sqrt{4}$

$= 16 - 2$

$= 14$

29.) $(5 - 2\sqrt{3})(\sqrt{12} - 3\sqrt{6})$

$= 5\sqrt{12} - 15\sqrt{6} - 2\sqrt{36} + 6\sqrt{18}$

$= 5\sqrt{4}\cdot\sqrt{3} - 15\sqrt{6} - 2\cdot 6 + 6$

$= 5\cdot 2\sqrt{3} - 15\sqrt{6} - 12 + 6\cdot 3\sqrt{2}$

$= 10\sqrt{3} - 15\sqrt{6} - 12 + 18\sqrt{2}$