Name ANSWER KEY Per. ALL Date _____

Radical Quiz Review

SIMPLIFYING RADICALS

Simplify the given expressions. Show all work.

1. $\sqrt{68}$

68 → 2, 34 → 2, 17

$2\sqrt{17}$

2. $4\sqrt{10} \cdot 3\sqrt{6}$

$12\sqrt{60}$

60 → 6, 10 → 3, 2, 5

$12 \cdot 2\sqrt{15}$

$24\sqrt{15}$

$2\sqrt{3 \cdot 5}$

3. $\sqrt{100x^3y}$

$10x\sqrt{xy}$

100 perfect square! $x \cdot x$ x

y

4. $\sqrt{72a^6b^3c^2}$

$2 \cdot 3 \cdot a^3 \cdot b \cdot c$

72 → 2, 36 → 6, 6 → 3, 3, 2

$a \cdot a$ $a \cdot a$ $a \cdot a$

$b \cdot b$ b

$c \cdot c$

$2 \cdot 3 \cdot a^3 \cdot b \cdot c\sqrt{2b}$

$6a^3bc\sqrt{2b}$

RATIONALIZING DENOMINATORS

Simplify the given expressions, being sure to rationalize denominators and simplify numerators completely. Show all work.

5. $\frac{\sqrt{8}}{\sqrt{24}} \cdot \frac{\sqrt{24}}{\sqrt{24}} = \frac{\sqrt{192}}{24}$

192 → 8, 24 → 2, 4, 2, 12 → 2, 2, 2, 6 → 2, 3

$= \frac{8\sqrt{3}}{24} = \frac{\sqrt{3}}{3}$

6. $\sqrt{\frac{2}{10}} = \sqrt{\frac{1}{5}} = \frac{\sqrt{1}}{\sqrt{5}}$

$= \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

7. $\sqrt{\frac{5}{32}} = \frac{\sqrt{5}}{\sqrt{32}} \cdot \frac{\sqrt{32}}{\sqrt{32}} = \frac{\sqrt{160}}{32}$

160 → 10, 16 → 5, 2, 2, 8 → 2, 4 → 2, 2

$4\sqrt{10}$

$\frac{4\sqrt{10}}{32}$

$= \frac{\sqrt{10}}{8}$

8. $\sqrt{\frac{b^3c^2}{a^3}} = \frac{\sqrt{b^3c^2}}{\sqrt{a^3}} \cdot \frac{\sqrt{a^3}}{\sqrt{a^3}}$

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

$a \cdot a$ a

$b \cdot b$ b

$c \cdot c$

$= \frac{abc\sqrt{ab}}{a^{\cancel{3}2}} = \frac{bc\sqrt{ab}}{a^2}$

OPERATIONS WITH RADICALS

Simplify the given expressions. Show all work.

9. $\sqrt{6} - 4\sqrt{6} = -3\sqrt{6}$

10. $\sqrt{8} - \sqrt{2} = 2\sqrt{2} - \sqrt{2}$

8 → 2, 4 → 2, 2

$= \sqrt{2}$

$2\sqrt{2}$

11. $3\sqrt{75} + 2\sqrt{5} = 5\sqrt{3} + 2\sqrt{5}$

25 → 5, 15 → 5, 3

$5\sqrt{3}$

12. $\sqrt{20} + 2\sqrt{5} - 3\sqrt{5}$

20 → 2, 10 → 2, 5

$2\sqrt{5}$

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

$= \sqrt{5}$

13. $\sqrt{2}(3\sqrt{7} + 2\sqrt{5})$

$\sqrt{2} \cdot 3\sqrt{7} + \sqrt{2} \cdot 2\sqrt{5}$

$3\sqrt{14} + 2\sqrt{10}$

14 → 2, 7

14. $3\sqrt{2}(\sqrt{8} + \sqrt{24})$

$3\sqrt{2} \cdot \sqrt{8} + 3\sqrt{2} \cdot \sqrt{24}$

$3\sqrt{16} + 3\sqrt{48} = 3 \cdot 4 + 3\sqrt{48}$

$12 + 3\sqrt{48} = 12 + 3 \cdot 2 \cdot 2\sqrt{3}$

$= 12 + 12\sqrt{3}$

48 → 4, 12 → 2, 2, 3, 4 → 2, 2