Academic Algebra II
Review 3.1-3.2

Name: Key
Date: _____

SHOW ALL WORK!

Rewrite the expression using rational exponent notation.

1. $(\sqrt[5]{63})^3$ → $63^{3/5}$

2. $\left(\sqrt[8]{11}\right)^7$ → $11^{7/8}$

3. $\left(\sqrt[5]{14}\right)^4$ → $14^{4/5}$

4. $(\sqrt[3]{-25})^4$ → $(-25)^{4/3}$

Evaluate the expression.

5. $(\sqrt[3]{27})^2$

$(3)^2$

9

27 → 3, 9 → 3, 3

6. $(\sqrt[3]{-64})^2$

$(\sqrt[3]{-64})^2$

$(-2^2)^3$

$(-4)^2$

16

64 → 8, 8 → 4, 2 → 2, 4 → 2, 2

7. $(16)^{1/4}$

$\sqrt[4]{16}$

2

16 → 4, 4 → 2, 2, 2, 2

Solve the equation. Round the result to two decimal places when appropriate.

8. $-4x^3 = 132$

$\frac{-4x^3}{-4} = \frac{132}{-4}$

$x^3 = -33$

$x = \sqrt[3]{-33}$

$x \approx -3.21$

9. $\sqrt[4]{(3x+2)^4} = \sqrt[4]{232}$

$3x + 2 = \pm\sqrt[4]{232}$

$\frac{3x}{3} = \frac{-2 \pm \sqrt[4]{232}}{3}$

$x = \frac{-2 \pm \sqrt[4]{232}}{3}$

$x = \frac{-2 + \sqrt[4]{232}}{3}$ $\quad x = \frac{-2 - \sqrt[4]{232}}{3}$

$x \approx 0.63$ $\quad x \approx -1.98$

10. $3x^5 + 3 = 213$

$\frac{3x^5}{3} = \frac{210}{3}$

$x^5 = 70$

$x = \sqrt[5]{70}$

$x \approx 2.34$

Simplify the expression. Assume all variables are positive.

11. $(4^{2/3} \cdot 5^{3/4})^3$

$4^2 \cdot 5^{9/4}$

$16 \cdot 5^{9/4}$

12. $\sqrt[4]{\frac{x^{17}}{y^8}}$

$\frac{\sqrt[4]{x^{17}}}{\sqrt[4]{y^8}}$

$\frac{x^4 \sqrt[4]{x}}{y^2}$

13. $\frac{x^{4\sqrt{3}}}{2x^{2\sqrt{3}}}$

$\frac{x^{4\sqrt{3}-2\sqrt{3}}}{2}$

$\frac{x^{2\sqrt{3}}}{2}$

14. $\frac{\sqrt[3]{x} \cdot \sqrt{x^5}}{\sqrt{25x^{16}}}$

$\frac{x^{1/3} \cdot x^{5/2}}{5x^8}$

$\frac{x^{1/3 + 5/2}}{5x^8}$

$\frac{x^{2/6 + 15/6}}{5x^8}$

$\frac{x^{17/6}}{5x^8}$

$\frac{\sqrt[6]{x^{17}}}{5x^8}$

$\frac{x^2 \sqrt[6]{x^5}}{5x^{8/6}}$

$\frac{\sqrt[6]{x^5}}{5x^6}$

Perform the indicated operation. Assume all variables are positive.

15. $2\sqrt{27} - 3\sqrt{48}$

48 = 2 · 24 = 2 · 3 · 8 = 2 · 3 · 2 · 4 = 2 · 3 · 2 · 2 · 2

27 = 3 · 9 = 3 · 3 · 3

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

$6\sqrt{3} - 12\sqrt{3}$

$-6\sqrt{3}$

16. $2\sqrt{x} + 7\sqrt{x}$

$9\sqrt{x}$

45 = 5 · 9 = 5 · 3 · 3

17. $5\sqrt{5} - \sqrt{45}$

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

$2\sqrt{5}$

18. $\left(x^4 y\right)^{\frac{1}{2}} + \left(xy^{\frac{1}{4}}\right)^2$

$x^2 y^{1/2} + x^2 y^{1/2}$

$2x^2 y^{1/2}$

19. $y\sqrt[4]{32x^6} + \sqrt[4]{162x^2 y^4}$

32 = 2 · 16 = 2 · 4 · 4 = 2 · 2 · 2 · 2 · 2

162 = 2 · 81 = 2 · 9 · 9 = 2 · 3 · 3 · 3 · 3

$2xy\sqrt[4]{2x^2} + 3y\sqrt[4]{2x^2}$

$(2xy + 3y)\sqrt[4]{2x^2}$