Unit 9 – Homefun Packet – DO ARE WORK ON A SEPARATE SHEET OF PAPER

Day 1 Worksheet – Review Radicals

Simplify the following radical expressions completely.

1. $\sqrt[4]{625}$ **2.** $\sqrt[4]{243}$ **3.** $\sqrt[5]{160a^{15}}$ **4.** $-\sqrt[3]{-64}$

5. $\sqrt{-240}$ **6.** $5\sqrt{5n} \bullet \sqrt{45n}$ **7.** $\sqrt{24}\left(3\sqrt{15}\right)$ **8.** $3\sqrt{20}+\sqrt{8}+\sqrt{5}$

9. $\left(10+\sqrt[3]{40}\right)-\left(4-3\sqrt[3]{5}\right)$ **10.** $-2\sqrt{15}\left(4\sqrt{10}-6\sqrt{21}\right)$ **11.** $\sqrt{3^2+3^2}$ **12.** $\dfrac{\sqrt{32}}{\sqrt{2}}$

13. $\sqrt{\dfrac{4}{7}}$ **14.** $\sqrt{\dfrac{36}{81}}$ **15.** $\dfrac{\sqrt[3]{128}}{\sqrt[3]{8}}$ **16.** $\sqrt[3]{\dfrac{2}{5}}$ **17.** $\dfrac{\sqrt[4]{6}}{\sqrt[4]{9}}$

Day 2 Worksheet – Exponent Review

Simplify the following.

1. $\left(9x^3\right)\left(-4x^{-5}\right)$ **2.** 4^{-3} **3.** $\left(-gh^4\right)^5$ **4.** $\dfrac{-12x^{-4}yz^{-6}}{8x^{-3}y^{-2}z^6}$

5. $\left(3x^2\right)^{-3}$ **6.** $c^2 \bullet c^{-7}$ **7.** $\left(-2b^5\right)^3\left(-b^{-3}\right)^4$ **8.** $\dfrac{7^3}{7^5}$

9. $\dfrac{\left(3ab^2\right)^4}{9ab^{14}}$ **10.** $\dfrac{\left(3a^0b^2\right)\left(-2a^{-4}b\right)}{-8a^5b^{-4}}$ **11.** $\left(\dfrac{3x^5y^2}{12xy^3}\right)^{-2}$ **12.** $m^7n^{-2}p^{-9}q^4$

13. $\left(\dfrac{-3y^4}{x^4y}\right)\left(\dfrac{5x^2y^2}{6x^3}\right)$ **14.** $\left(\dfrac{-9s^{-12}t^9}{-3s^8t^6}\right)^3$

Day 3 Worksheet – Rational Exponents

Rewrite in radical form and simplify.

1) $243^{\frac{1}{5}}$ **2)** $\left(36a^6\right)^{\frac{1}{2}}$ **3)** $-121^{\frac{1}{2}}$ **4)** $(-144)^{\frac{1}{2}}$

6) $\left(-125k^7\right)^{\frac{1}{3}}$ **7)** $44^{\frac{1}{2}}$ **8)** $\left(24x^5\right)^{\frac{1}{3}}$ **9)** $16^{\frac{3}{2}}$

10) $\left(81n^{12}\right)^{\frac{2}{3}}$ **11)** $625^{\frac{3}{4}}$ **12)** $3^{\frac{7}{5}}$ **13)** $(27x^2)^{\frac{4}{3}}$

14) $-5x^{\frac{3}{2}}$ **15)** $11^{\frac{6}{2}}$

Rewrite in exponential form.

16) $\left(\sqrt{7}\right)^9$ **17)** $\sqrt{27}$ **18)** $\sqrt[3]{16}$

Day 4 Worksheet – Operations with Rational Exponents

Simplify. Write your answers in exponential form and radical from.

1) $7^{\frac{1}{2}} \bullet 7^{\frac{3}{4}}$

2) $\left(2x^{\frac{2}{3}}\right)^{3}$

3) $\dfrac{6^{\frac{3}{7}}}{6^{\frac{1}{7}}}$

4) $5^{\frac{5}{6}} \bullet 5^{\frac{2}{12}}$

5) $\dfrac{3^{2}}{3^{\frac{1}{4}}}$

6) $\left(\dfrac{-32x^{12}y^{10}}{x^{2}y^{-5}}\right)^{\frac{1}{5}}$

7) $\left(G^{\frac{5}{6}}\right)^{\frac{2}{5}}$

8) $\left(8^{\frac{2}{3}} \bullet 2^{\frac{1}{6}}\right)^{3}$

9) $\dfrac{8^{2}}{2^{4}}$

10) $\sqrt{5} \bullet \sqrt[3]{25}$

11) $4^{\frac{2}{5}} \bullet 8^{\frac{1}{5}}$

12) $11^{\frac{1}{2}} \bullet 11^{\frac{3}{4}}$

Day 5 Worksheet – Operations with Rational Exponents

Simplify. Write your answers in exponential form and radical from. Assume all variables are positive.

1) $5^{\frac{1}{7}} \bullet 9^{\frac{1}{7}}$

2) $7^{\frac{3}{4}} \bullet 7^{\frac{1}{4}}$

3) $\left(5^{\frac{2}{7}} \bullet 16^{\frac{2}{7}}\right)^{7}$

4) $\left(10^{\frac{1}{6}}\right)^{\frac{2}{3}}$

5) $\dfrac{2^{\frac{1}{4}}}{2^{\frac{3}{4}}}$

6) $5^{\frac{1}{3}} \bullet 25^{\frac{1}{3}}$

7) $7^{-\frac{3}{4}}$

8) $\dfrac{3}{3^{-\frac{2}{3}}}$

9) $\left(\dfrac{4^{5}}{9^{5}}\right)^{-\frac{2}{5}}$

10) $\dfrac{8^{\frac{1}{3}}}{8^{-\frac{5}{6}}}$

11) $2^{\frac{1}{3}} \bullet 8^{\frac{1}{5}}$

12) $\dfrac{48^{\frac{1}{3}}}{3^{-\frac{1}{3}}}$

Day 6 Worksheet – Solve Expo Equations

Solve the following equations.

1) $5^{2x+1} = 5^{3x-5}$

2) $4^{x} = 32$

3) $3^{5x} = 81$

4) $8^{x-7} = 8$

5) $25^{3x} = 5^{x-12}$

6) $4 = 64^{x}$

7) $5^{x-4} = 25^{x-6}$

8) $36^{5x+2} = \left(\dfrac{1}{6}\right)^{11-x}$

9) $3^{3x-7} = 81^{12-3x}$

10) $e^{5x+2} = e^{3x+12}$

11) $16 = 2^{x^{2}}$

12) $9^{3x-4} = 3^{x^{2}}$

13) $y = 27$ **and** $y = 3^{4x}$

14) $y = 32^{x}$ **and** $y = 2^{x+3}$

15) $16^{x-10} + 8 = 24$

ALGEBRA 2 **Name:**_____
Unit 9 Review **Date:**_____**Period:**_____

<u>Simplify the following completely.</u>

1. $\sqrt[3]{432}$

2. $\sqrt[5]{224a^{17}}$

3. $-2\sqrt{5}\left(4\sqrt{10}-6\sqrt{30}\right)$

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

5. $3\sqrt{7n^2}\bullet 5\sqrt{21n^3}$

6. $\sqrt[3]{80}-\sqrt[3]{270}$

7. $\sqrt{12}\left(3\sqrt{15}\right)$

8. $\left(\frac{12y^{101}z^{564}}{-32y^{623}z}\right)^0$

9. $\frac{-21x^{-5}yz^2}{7x^2y^{-3}z^2}$

10. $\left(4x^3\right)^{-3}$

11. $\left(-3c^3d^5\right)^4\left(-2cd^3\right)^3$

12. $\left(\frac{4a^{-5}b^3}{16a^2b^{-2}}\right)^{-2}$

13. $\left(\frac{-3y^3}{x^2y^2}\right)\left(\frac{3x^2y^3}{6x^3}\right)^2$

14. $(-27)^{\frac{1}{3}}$

15. $-81^{\frac{1}{4}}$

16. $(96x^9)^{\frac{1}{2}}$

17. $5^{\frac{8}{3}}$

18. $27^{\frac{2}{3}}$

19. $(6y^2)^{\frac{5}{3}}$

20. Simplify in exponential form: $\sqrt[10]{32}$

21. $3^{\frac{1}{3}} \bullet 3^{\frac{5}{6}}$

22. $4^{-\frac{2}{3}}$

23. $2^{\frac{1}{6}} \bullet 8^{\frac{1}{2}}$

24. $\sqrt{3} \bullet \sqrt[3]{3}$

25. $\dfrac{7^4}{7^{\frac{5}{2}}}$

26. $\left(x^4\right)^{\frac{5}{6}}$

27. $6^{\frac{1}{3}} \bullet 18^{\frac{1}{3}}$

28. $\dfrac{10}{5^{\frac{3}{2}}}$

29. $\sqrt{2} \bullet \sqrt[3]{4}$

30. $2^{x-8} = 64$

31. $8^{x^2} = 64^{2x+16}$

32. $4^x = 1024$

33. $64^{x^2} = 2^{8x}$

34. $4^{x-3} = 8^x$

35. Solve the system: $y = 27^x$ and $y = 3^{4x+5}$

36. Two students make claims about the expression $y^{3/2}$. Each student's work supporting their claim is shown below.

Student #1	Student #2
Claim: $y^{3/2} = \left(\sqrt[3]{y}\right)^2$	Claim: $y^{3/2} = \sqrt{y^3}$
Work: $y^{3/2} = \left(y^{1/3} \cdot y^{1/3}\right)$	Work: $y^{3/2} = (y \cdot y \cdot y)^{1/2}$
$= \left(\sqrt[3]{y} \cdot \sqrt[3]{y}\right)$	$= \sqrt{y \cdot y \cdot y}$
$= \left(\sqrt[3]{y}\right)^2$	$= \sqrt{y^3}$

Which of the following statements about each student's work and claim is true?

A. Student 1 makes a correct claim and their supporting work shown is correct.

B. Student 1 makes an incorrect claim because $y^{3/2} = (y^2 \cdot y^2 \cdot y^2)^{1/3}$

C. Student 2 makes a correct claim and their supporting work shown is correct.

D. Student 2 makes an incorrect claim because $y^{3/2} = (y \cdot y)^{1/3}$.

37. Simplify the expression: $\sqrt[4]{1296x^{12}y^{32}}$

A. $6x^8y^{28}$

B. $6|x^3|y^8$

C. $324|x^3|y^8$

D. $\left|324x^{1/3}y^{1/8}\right|$

38. What value of x makes the following equation true?

$$\frac{y^{3/4}}{y^{x/8}} = \sqrt[8]{y}$$

A. $x = 7$

B. $x = 6$

C. $x = 5$

D. $x = 4$

39. Simplify: $\sqrt{4x^7} + 9x^2\sqrt{x^3} - 5x\sqrt{x^5}$

A. $6x^3\sqrt{x}$

B. $8x^3\sqrt{x}$

C. $16x^9\sqrt{x}$

D. $-90x^{10}\sqrt{x}$

40. Simplify $\sqrt[5]{x^7} \cdot \sqrt[3]{x}$

A. $x^{22/15}$

B. x

C. x^2

D. $x^{26/15}$