

Name: Key Class Period: _____

Math 2: Unit 4 Review Sheet

Part 1. Exponent Rules

Fully simplify the following exponents using exponent rules.

1. $(-7x^2)(4x^7)$

$-28x^9$

2. $(-3x^6y^2)(2x^5y^3)$

$-6x^{11}y^5$

3. $(2x^6y^2)(3x^7y)(-5xy^7)$

4. $(2x^6)^3$

$8x^{18}$

5. $(4x^6y^4z^2)^2$

$16x^{12}y^8z^4$

6. $(5xy^8)^3(2x^6y^3)^2$
 $(125x^3y^{24})(4x^{12}y^6)$

7. $\frac{20x^6}{2x^3}$

$10x^3$

8. $\left(\frac{6xy^6}{2x^2y^7}\right)^0$

1

9. $\frac{28x^4y^7}{16x^{-3}y^{-3}}$

$\frac{7}{4}x^7y^{10}$

Part 2. Radicals and Fractional Exponents

Convert each radical to a fractional exponent

10. $\sqrt[5]{x^6}$

$x^{\frac{6}{5}}$

11. $\sqrt{y^3}$

$y^{\frac{3}{2}}$

12. $\frac{1}{\sqrt[9]{(5z)^5}}$

$(5z)^{-\frac{5}{9}}$

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

$2^{\frac{1}{3}}x^{\frac{4}{3}}$

Convert each fractional exponent to a radical

14. $x^{\frac{1}{3}}$

$\sqrt[3]{x}$

15. $y^{-\frac{5}{11}}$

$\frac{1}{\sqrt[11]{y^5}}$

16. $(5z)^{\frac{2}{3}}$

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

17. $6x^{\frac{4}{9}}$

$6\sqrt[9]{x^4}$

Solve the radical equation using inverses.

18. $(x^{\frac{1}{4}})^4 = (5)^4$

$x = 625$

19. $2x^{\frac{1}{2}} + 4 = 50$

$\frac{2x^{\frac{1}{2}}}{2} = \frac{54}{2}$
 $x^{\frac{1}{2}} = (27)^{\frac{2}{1}}$
 $x = 729$

20. $\sqrt{3x-1} + 5 = 100$

$(\sqrt{3x-1})^2 = (95)^2$
 $3x-1 = 9025$
 $\frac{3x}{3} = \frac{9026}{3}$ $x = 3008.7$

Part 3: Variation

21. Y varies directly as x. When $y = 9, x = 15$. What does x equal when $y = 45$?

$$y = kx \quad 9 = k(15) \quad 45 = 0.6(x)$$

$$k = 0.6 \quad \boxed{x = 75}$$

22. Y varies inversely as x. When $y = 16, x = 38$. What does y equal when $x = 32$?

$$y = \frac{k}{x} \quad 16 = \frac{k}{38} \quad y = \frac{608}{32} \quad \boxed{y = 19}$$

$$k = 608$$

23. The time it takes for a train to travel varies inversely with the speed the train is traveling. If a train travels between two cities in 3 hours at an average speed of 65 miles per hour, how long would it take at an average speed of 80 miles per hour?

$$y = \frac{k}{x} \quad 65 = \frac{k}{3} \quad 80 = \frac{195}{x} \quad \boxed{x = 2.44 \text{ hours}}$$

$$k = 195$$

24. The distance that a spring is stretched by a hanging object varies directly as the mass of the object. If the spring stretches 20 cm when the mass is 3 kg, what is the distance that the spring stretches when the mass is 8 kg?

$$y = kx \quad y = 6.67(8)$$

$$20 = k(3) \quad k = 6.67 \quad \boxed{y = 53.\bar{3} \text{ cm}}$$

Part 4: Rational Equations

Determine what the common denominator would be for each rational equation.

25. $\frac{5x}{5} + \frac{1}{2} = \frac{x+5}{3}$

C.D. = 30

26. $\frac{4}{(x-2)} + \frac{1}{(x+8)} = \frac{x+2}{(x+8)(x-2)}$

C.D. = $(x+8)(x-2)$

Solve the rational equations for x.

27. $\frac{3}{2x} - \frac{1}{3} = \frac{13}{6x}$ CD: $6x$

$$3(3) - 1(2x) = 13$$

$$9 - 2x = 13$$

$$-2x = 4$$

X = -2

28. $\frac{2x}{(x+3)(x-3)} + \frac{3}{x+3} = \frac{1}{(x-3)}$ CD: $(x+3)(x-3)$

$$2x + 3(x-3) = 1(x-3)$$

$$2x + 3x - 9 = x - 3$$

$$5x - 9 = x - 3 \rightarrow 4x = 12$$

X = 3