

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Block: \_\_\_\_\_

Unit 3 TEST REVIEW Math II

1-4. Simplify the expressions

1.  $\left(\frac{-4s^6}{t^3r^5}\right)^3 =$

2.  $(14a^4b^6)^2(a^6c^3)^7 =$

3.  $\frac{-20xy^8}{3x^{-4}y^2} \cdot \frac{-5x^{-3}y^5}{(-2y)^3} =$

4.  $\left(\frac{4x^{-3}y^2}{6xy^{-3}}\right)^{-2} \cdot \frac{y^4}{x^6y^{-5}} =$

1.  $\frac{(-4)^3 s^{6 \cdot 3}}{t^{3 \cdot 3} r^{5 \cdot 3}} = \frac{-64s^{18}}{t^9 r^{15}}$

2.  $(14^2 a^{4 \cdot 2} b^{6 \cdot 2})(a^{6 \cdot 7} c^{3 \cdot 7})$   
 $= 196 a^8 b^{12} a^{42} c^{21}$   
 $= 196 a^{50} b^{12} c^{21}$

3. warm-up:  $\frac{-25x^2y^8}{6}$

4.  $\frac{4^{-2} x^6 y^{-4}}{6^{-2} x^{-2} y^6} \cdot \frac{y^4}{x^6 y^{-5}}$

5.  $a^{\frac{9}{7} - \frac{4}{7}} = a^{\frac{5}{7}} = \sqrt[7]{a^5}$

$= \frac{6^2 x^6 x^2 y^4 y^5}{4^2 y^6 y^4 x^6} = \frac{36 x^8 y^9}{16 y^{10} x^6}$

6.  $\sqrt[4]{16x^8} = \sqrt[4]{2^4 x^8} = 2x^2$

$= \frac{9x^2}{4y}$

5-7 Rationalize the exponents. Write your answers in radical form.

$a^{\frac{9}{7}}$

5.  $a^{\frac{4}{7}}$

6.  $\sqrt[4]{16x^8}$

7.  $\left(-3y^{\frac{1}{3}}\right)^3$

7.  $-3^3 y^{\frac{1}{3} \cdot 3} = -3^3 y^1 = -27y$

8.  $\frac{4}{\sqrt[3]{9x^2y^8}} \cdot \frac{\sqrt[3]{9^2x^1y^1}}{\sqrt[3]{9^2x^1y^1}} = \frac{4 \sqrt[3]{81xy}}{\sqrt[3]{9^3x^3y^9}} = \frac{4 \sqrt[3]{3^3 \cdot 3^1 xy}}{9xy^3} = \frac{4 \cdot 3 \sqrt[3]{3xy}}{9xy^3}$

9.  $\frac{2\sqrt{3}}{\sqrt{6}-\sqrt{2}} \cdot \frac{\sqrt{6}+\sqrt{2}}{\sqrt{6}+\sqrt{2}} = \frac{2\sqrt{18}+2\sqrt{6}}{6-2} = \frac{2\sqrt{9 \cdot 2}+2\sqrt{6}}{4} = \frac{2 \cdot 3\sqrt{2}+2\sqrt{6}}{4}$

$= \frac{6\sqrt{2}+2\sqrt{6}}{4} \rightarrow \frac{3\sqrt{2}+\sqrt{6}}{2}$

8-10. Rationalize the denominator.

8.  $\frac{4}{\sqrt[3]{9x^2y^8}}$

9.  $\frac{2\sqrt{3}}{\sqrt{6}-\sqrt{2}}$

10.  $\frac{5\sqrt{3}+2\sqrt{6}}{2\sqrt{11}-3\sqrt{6}}$

10.  $\frac{5\sqrt{3}+2\sqrt{6}}{2\sqrt{11}-3\sqrt{6}} \cdot \frac{2\sqrt{11}+3\sqrt{6}}{2\sqrt{11}+3\sqrt{6}} = \frac{10\sqrt{33}+4\sqrt{66}+15\sqrt{18}+6\sqrt{36}}{4 \cdot 11 - 9 \cdot 6}$

$= \frac{10\sqrt{33}+4\sqrt{66}+15\sqrt{9 \cdot 2}+6 \cdot 6}{44-54}$

$= \frac{10\sqrt{33}+4\sqrt{66}+45\sqrt{2}+36}{-10}$

11-12 simplify radicals

11.  $\sqrt{8x^7y^{16}z}$

11.  $\sqrt{4 \cdot 2x^6 \cdot x^1 y^{16} z^1}$

$= 2x^3 y^8 \sqrt{2xz}$

Unit 3 TEST REVIEW Math II

12.  $2a^2b^5c\sqrt{45ab^5c^9}$

12.  $2a^2b^5c\sqrt{9 \cdot 5ab^4 \cdot b \cdot c^8 \cdot c} = 2a^2b^5c \cdot 3b^2c^4\sqrt{5abc}$   
 $= 6a^2b^7c^5\sqrt{5abc}$

13- 16 ADD, SUBTRACT AND MULTIPLY THE RADICAL EXPRESSION

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

13.  $10 - 2\sqrt{3} + 10\sqrt{3} - 2 \cdot 3$   
 $10 - 2\sqrt{3} + 10\sqrt{3} - 6$   
 $4 + 8\sqrt{3}$

14.  $(4\sqrt{5} + 3\sqrt{3})(3\sqrt{5} - 4\sqrt{3})$

14.  $12 \cdot 5 - 16\sqrt{15} + 9\sqrt{15} - 12 \cdot 3$   
 $60 - 7\sqrt{15} - 36$   
 $24 - 7\sqrt{15}$

15.  $\sqrt{3}(2\sqrt{5} - 3\sqrt{2})$

15.  $2\sqrt{15} - 3\sqrt{6}$

16.  $10\sqrt{63} - 2\sqrt{28} + \sqrt{7}$

16.  $10\sqrt{9 \cdot 7} - 2\sqrt{4 \cdot 7} + \sqrt{7}$   
 $10 \cdot 3\sqrt{7} - 2 \cdot 2\sqrt{7} + \sqrt{7}$   
 $30\sqrt{7} - 4\sqrt{7} + \sqrt{7}$   
 $27\sqrt{7}$

17-19 solve the radical equations

17.  $2\sqrt{2x-1} - 4 = -24$

17.  $2\sqrt{2x-1} = -24 + 4$   
 $2\sqrt{2x-1} = -20$   
 $\frac{2\sqrt{2x-1}}{2} = \frac{-20}{2}$   
 $\sqrt{2x-1} = -10$   
 $(\sqrt{2x-1})^2 = (-10)^2$   
 $2x-1 = 100$

18.  $\sqrt[3]{3x-5} = \sqrt[3]{5x+2}$

18.  $(\sqrt[3]{3x-5})^3 = (\sqrt[3]{5x+2})^3$   
 $3x-5 = 5x+2$   
 $3x-5x = 2+5$   
 $-2x = 7$

19.  $\sqrt{3x+10} = 5 - 2x$

extraneous  $\rightarrow x = 50.5$   $\leftarrow 2x = 101$

Solution:  $x = \frac{7}{2}$

Use the following table to answer questions 20- 22.

20. yes, because they all have the same constant.

$k=30$   
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X	Y
15	2
10	3
5	6
3	10

$y = \frac{k}{x}$

20. Does this show an inverse variation/proportion relationship? Explain why or why not.

21. What is the constant (k)?  $= 30$

22. What is the equation for this table?  $y = \frac{k}{x}$

23. If I am looking at an inverse relation, if y increases what happens to x? Explain what happens to y as x decreases.   
 If y increases, x decreases.  
 If y decreases, x increases.

24. The time it takes to fly from Los Angeles to New York varies inversely as the speed of the plane. If the trip takes 6 hours at 900 km/h, how long would it take at 800 km/h?

$T = \frac{k}{S} \rightarrow G = \frac{k}{900} \rightarrow k = 5400$

$T = \frac{5400}{800} = 6.75 \text{ hours}$

Solution extraneous

$x = \frac{3}{4}$   $x = 5$

Unit 3 TEST REVIEW Math II

25. The power,  $P$ , in watts of an electrical circuit varies jointly as the resistance,  $R$ , and the square of the current,  $C$ .<sup>k</sup> For a 240-watt refrigerator that draws a current of 2 amperes, the resistance is 60 ohms. What is the resistance of a 600-watt microwave oven that draws a current of 5 amperes?

26. The force needed to keep a car from skidding on a curve varies directly as the weight of the car and the square of the speed and inversely as the radius of the curve.<sup>k</sup> Suppose a 3,960 lb. force is required to keep a 2,200 lb. car traveling at 30 mph from skidding on a curve of radius 500 ft. How much force is required to keep a 3,000 lb. car traveling at 45 mph from skidding on a curve of radius 400 ft.?

$$25. \quad P = kRC^2$$

$$240 = k(60)(2)^2$$

$$\frac{240}{240} = \frac{k(240)}{240}$$

$$k = 1$$

$$P = kRC^2$$

$$600 = (1)R(5^2)$$

$$\frac{600}{25} = \frac{25R}{25}$$

$$R = 24$$

$$26. \quad F = \frac{kWs^2}{R}$$

$$3960 = \frac{k(2200)(30)^2}{500}$$

$$3960 = \frac{k(2200)(900)}{500}$$

$$3960 = \frac{1980000k}{500}$$

$$k = \frac{1980000}{1980000}$$

$$F = \frac{(1)(3000)(45)^2}{400}$$

$$F = \frac{(3000)(2025)}{400}$$

$$F = \frac{6075000}{400}$$

$$F = 15187.5$$

$$k = 1$$