Honors Algebra II Key Unit 4: Rationals review WS – 4.10

Name: _____ Date _____

1. When is a rational expression undefined? when denominator = 0

2. What value of x makes $\frac{(x+4)(2x-1)}{(x+3)(3x-4)}$ undefined? $x \neq -3, 4/3$

Simplify. Identify any x-values for which the expression is undefined.

3. $\frac{5xy^4z^2}{20x^3yz^6}$ $\frac{y^3}{4x^2z^4}$ $x \neq 0$

4. $\frac{4x+12}{6x+18}$ $\frac{2}{3}$ $x \neq -3$

Multiply or Divide. Assume all expressions are defined.

5. $\frac{2x^3y^6}{5x^2y^3} \cdot \frac{15x^2y^2}{10x^4y}$ $\frac{3y^4}{5x}$

6. $\frac{2x+14}{x^2-25} \cdot \frac{8x+40}{6x+42}$ $\frac{8}{3(x-5)}$

7. $\frac{4x^3+12x^2}{2x^3-16x^2} \cdot \frac{2x^2-10x-48}{x+3}$ $\frac{4(x+3)}{}$

8. $\frac{4x^3y^2}{2x^6y} \div \frac{xy+2y}{x^2-3x-10}$ $\frac{2(x-5)}{x^3}$

9. $\frac{3x^2+6x-24}{x^2-x-20} \div \frac{3x^3-9x^2+6x}{x}$ $\frac{1}{(x-5)(x-1)}$

10. $\frac{4x^3y^{12}}{y^5x^2} \div \frac{6y^7m^3x^3}{3m^3y}$ $\frac{2y}{x^2}$

Add or subtract. Identify any x-values for which the expression is undefined.

11. $\frac{2x-3}{x+4} + \frac{4x-5}{x+4}$ $\frac{2(3x-4)}{x+4}$, $x \neq -4$

12. $\frac{x+12}{2x-5} - \frac{3x-2}{2x-5}$ $\frac{-2(x-7)}{2x-5}$, $x \neq 5/2$

13. $\frac{x+4}{x^2-x-12} + \frac{2x}{x-4}$ $\frac{2x^2+7x+4}{(x-4)(x+3)}$ $x \neq 4, -3$

14. $\frac{3x^2-1}{x^2-3x-18} - \frac{x+2}{x-6}$ $\frac{(2x-7)(x+1)}{(x-6)(x+3)}$, $x \neq 6, -3$

15. $\frac{x+2}{x^2-2x-15} + \frac{x}{x+3}$ $\frac{x^2-4x+2}{(x+3)(x-5)}$ $x \neq -3, 5$

16. $\frac{x+6}{x^2-7x-18} - \frac{2x}{x-9}$ $\frac{-1(2x^2+3x-6)}{(x-9)(x+2)}$ $x \neq 9, -2$

Solve each equation.

17. $\frac{12r}{r+2}+6=\frac{4}{r+2}$ $r \neq -2$

$r = -4/9$

18. $\frac{4x}{x-4}=\frac{2x+8}{x-4}$ $x \neq 4$

~~$x=4$~~ No Solution

19. $\frac{2}{d+2}+\frac{8}{d-2}=\frac{14}{d^2-4}$ $d \neq \pm 2$

$d = 1/5$

20. $\sqrt[3]{3x-7}+1=3$

$x = 5$

21. $\sqrt{2x+5}=x-5$

$x = 10, \cancel{2}$

22. $2\sqrt[4]{3x}=\sqrt[4]{4x+4}$

$x = 1/11$

23. $\sqrt{2x+15}=x$

$x = 5, \cancel{-3}$

24. $5(x+5)^{\frac{1}{3}}=-15$

$x = -32$

* Square roots $\neq -\#$
* Cubed roots can!

25. List any extraneous solutions for the equation $\frac{2x}{x+4}=\frac{x}{x-1}$.

None! Both work

26. Team A can wash all the windows in the school in x hours. It takes Team B 13 hours to do the same job. If the teams work together, they can complete the job in 8.5 hours. How long does it take Team A to do the job alone?

It would take 24.6 hours for Team A to work alone.

27. A swimmer spends the afternoon exercising on a river. She travels 5 miles upstream and 5 miles downstream in a total of 6 hours. In still water, the swimmer can travel at an average speed of 2 mi/h. Based on this information, what is the average speed of the river's current?

The river's current is going .82 mph

28. A plane can go 560 miles with the wind in the same amount of time it takes to go 410 miles against the wind. If the wind is 56 miles per hour, what is the average speed of the plane going against the wind?

The speed going against the wind is 306.1 mph.

Simplify.

29. $4x\sqrt{2xy^2} + \sqrt[3]{40x^6} + x\sqrt[3]{5x^3} - y\sqrt{8x^3}$

$2xy\sqrt{2x} + 3x^2\sqrt[3]{5}$

30. $\left(\frac{6^{\frac{1}{2}}}{6^{\frac{1}{3}}}\right)^{\frac{3}{5}}$

$6^{\frac{1}{10}}$

31. $\frac{x^{\frac{5}{4}}y^{\frac{2}{3}}}{xy^{-2}}$

$x^{1/4}\ y^{8/3}$

32. $5a^2b\sqrt[4]{24a^2c^6} \cdot 3ac^2\sqrt[4]{20a^5bc}$

$30a^4bc^3\sqrt[4]{30a^3bc^3}$

33. $\sqrt[5]{(2x^2)^3(2x^2)^7}$

$4x^4$

34. $\sqrt[5]{\frac{x^5}{y^3}}$

$\frac{x\sqrt[5]{y^2}}{y}$

35. $\frac{\frac{-8}{x+1}+4}{\frac{2}{x}-\frac{2}{x^2}}$

$\frac{2x^2}{x+1}$