

Honors Math 3

Unit 5 – Day 3 and Day 4 Homework

Please do your work on a separate sheet of paper. You must show ALL work and attempt ALL problems to receive full credit. Please check your answers BEFORE class!

DAY 3 p. 239: 1-21 EOO (every other odd) AND circled problems on the back! ;)

DAY 4 p. 239: 3-23 EOO

Simplify.

1. $\frac{1 - \frac{1}{3}}{\frac{1}{2} - \frac{1}{6}}$ 2

2. $\frac{\frac{1}{2} + \frac{1}{3}}{1 - \frac{1}{6}}$

3. $\frac{1 - \frac{4}{5}}{\frac{1}{4} - \frac{1}{5}}$ 4

4. $\frac{\frac{2}{3} - \frac{5}{6}}{\frac{1}{3} + \frac{2}{9}}$

5. $\frac{x+1}{1 + \frac{1}{x}}$ x

6. $\frac{z - \frac{1}{z}}{1 - \frac{1}{z}}$

7. $\frac{a-b}{a^{-1} - b^{-1}}$ -ab

8. $\frac{1 - xy^{-1}}{x^{-1} - y^{-1}}$

9. $\frac{u^{-2} - v^{-2}}{u^{-1} - v^{-1}}$ $\frac{v+u}{vu}$

10. $\frac{a^{-2} - b^{-2}}{a^{-1} + b^{-1}}$

11. $\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x^2} + \frac{2}{xy} + \frac{1}{y^2}}$ $\frac{y-x}{y+x}$

12. $\frac{\frac{1}{p^2} - \frac{1}{q^2}}{\frac{2}{p^2} - \frac{1}{pq} - \frac{1}{q^2}}$

13. $\frac{h+h^{-2}}{1+h^{-1}}$ $\frac{h^2-h+1}{h}$

14. $\frac{x^{-2} - x^2}{x^{-1} - x}$

15. $\frac{s^2 - t^{-2}}{s - t^{-1}}$ $\frac{st+1}{t}$

Simplify.

16. $\frac{\frac{1}{x} - \frac{1}{y}}{\frac{y}{x} - \frac{x}{y}}$

17. $\frac{\frac{2}{y+2} - 1}{\frac{1}{y+2} + 1}$ $\frac{-y}{y+3}$

18. $\frac{1 + \frac{1}{t-1}}{1 - \frac{1}{t+1}}$

19. $\frac{\frac{1}{a+1} + \frac{1}{a-1}}{\frac{1}{a+1} - \frac{1}{a-1}}$ -a

20. $\frac{\frac{1}{x} + \frac{1}{x+1}}{\frac{1}{x} - \frac{1}{x+1}}$

21. $\frac{1 + \frac{1}{x-1}}{1 + \frac{1}{x^2-1}}$ $\frac{x+1}{x}$

22. $\frac{\frac{1}{1-t} - \frac{1}{t}}{\frac{1}{1+t} - \frac{1}{t}}$

23. $\frac{\frac{a}{b} - \frac{a-b}{a+b}}{\frac{a}{b} + \frac{a+b}{a-b}}$ $\frac{a-b}{a+b}$

24. $\frac{\frac{u+v}{u-v} - \frac{u-v}{u+v}}{\frac{u+v}{u-v} + \frac{u-v}{u+v}}$

NAME _____

-Key

DATE _____

SCORE _____

Rational Expressions (For use after Lesson 5-7)

Simplify.

1. $\frac{8x^2z}{6x^5z^{-2}}$ $\frac{4z^3}{3x^3}$
2. $(x-1)^{-2}(x^2-1)$ $\frac{x+1}{x-1}$
3. $\frac{a^3-2a^2}{(a-2)^2}$ $\frac{a^2}{a-2}$
4. $\frac{c^2-2c-15}{2c-10}$ $\frac{c+3}{2}$
5. $\frac{2c^2+5c-3}{4c^2-1}$ $\frac{c+3}{2c+1}$
6. $\frac{a^4-b^4}{a^3+a^2b+ab^2+b^3}$ $\frac{a-b}{a-b}$
7. $(\frac{6a^3}{b^2})(\frac{a^2}{4b^3})^{-3}$ $\frac{384b^7}{a^3}$
8. $\frac{x^2}{x^2-1} \div \frac{4x}{x^2-2x+1}$ $\frac{x^2-x}{4x+4}$
9. $\frac{x^2+x-6}{x^2-4x-5} \cdot \frac{x^2-2x-8}{x^2+2x-8}$ $\frac{(x+3)(x-4)(x+2)}{(x-5)(x+1)(x+4)}$
10. $\frac{2}{a} - \frac{3}{a^2}$ $\frac{2a-3}{a^2}$
11. $\frac{2}{x} + \frac{5}{y}$ $\frac{5x+2y}{xy}$
12. $\frac{3}{x} - \frac{3}{x-2}$ $\frac{-b}{x^2-2x}$
13. $1 - \frac{2}{x} - \frac{3}{x^2}$ $\frac{x^2-2x-3}{x^2}$
14. $\frac{2x+y}{2x-y} + \frac{2x-y}{2x+y}$ $\frac{8x^2+2y^2}{4x^2-y^2}$
15. $\frac{3}{x^2+2x} - \frac{2}{x^2+x-2} + \frac{1}{x+2}$ $\frac{x^2-3}{x(x+2)(x-1)}$
16. $\frac{a}{bc} + \frac{b}{ac}$ $\frac{a^2+b^2}{abc}$
17. $\frac{1-\frac{1}{3}}{1+\frac{1}{3}}$ $\frac{1}{2}$
18. $\frac{\frac{1}{5}-\frac{1}{3}}{\frac{1}{10}+1}$ $\frac{-4}{33}$
19. $\frac{x+\frac{1}{x}}{1+\frac{1}{x}}$ $\frac{x^2+1}{x+1}$
20. $\frac{1+x}{1-\frac{2}{x}}$ $\frac{x^2+x}{x-2}$
21. $\frac{x^{-1}+y^{-1}}{x^{-1}-y^{-1}}$ $\frac{y+x}{y-x}$
22. $\frac{1}{\frac{x-y}{\frac{1}{x}+\frac{1}{y}}}$ $\frac{xy}{x^2-y^2}$

$$\frac{(x+3)(\cancel{x-2})}{(x-5)(x+1)} \cdot \frac{(x-4)(x+2)}{(x+4)(\cancel{x-2})}$$

Solve each system. Note that the equations in Exercises 33–38 are not linear in the original variables. (Hint: Let $x = \frac{1}{u}$ and $y = \frac{1}{v}$. Rewrite the system in terms of x and y and solve. Then use x and y to find u and v .)

$$33. \begin{cases} \frac{6}{u} + \frac{3}{v} = 2 \\ \frac{2}{u} - \frac{9}{v} = 4 \end{cases}$$

$(2, -3)$

$$34. \begin{cases} \frac{6}{u} + \frac{5}{v} = 1 \\ \frac{3}{u} - \frac{10}{v} = 3 \end{cases}$$

$$35. \begin{cases} \frac{2}{u} - \frac{3}{v} + 2 = 0 \\ \frac{4}{u} + \frac{3}{v} + 1 = 0 \end{cases}$$

$(-2, 3)$

$$36. \begin{cases} \frac{3}{u} + \frac{4}{v} = 1 \\ \frac{6}{u} - \frac{2}{v} = 1 \end{cases}$$

$$37. \begin{cases} \frac{3}{u} - \frac{4}{v} = 4 \\ \frac{5}{u} - \frac{6}{v} = 7 \end{cases}$$

$(\frac{1}{2}, 2)$

$$38. \begin{cases} \frac{4}{u} + \frac{3}{v} = 3 \\ \frac{6}{u} + \frac{5}{v} = 4 \end{cases}$$

Solve each system. Note that the equations in Exercises 33–38 are not linear in the original variables. (Hint: Let $x = \frac{1}{u}$ and $y = \frac{1}{v}$. Rewrite the system in terms of x and y and solve. Then use x and y to find u and v .)

$$33. \begin{cases} \frac{6}{u} + \frac{3}{v} = 2 \\ \frac{2}{u} - \frac{9}{v} = 4 \end{cases}$$

$$34. \begin{cases} \frac{6}{u} + \frac{5}{v} = 1 \\ \frac{3}{u} - \frac{10}{v} = 3 \end{cases}$$

$$35. \begin{cases} \frac{2}{u} - \frac{3}{v} + 2 = 0 \\ \frac{4}{u} + \frac{3}{v} + 1 = 0 \end{cases}$$

$$36. \begin{cases} \frac{3}{u} + \frac{4}{v} = 1 \\ \frac{6}{u} - \frac{2}{v} = 1 \end{cases}$$

$$37. \begin{cases} \frac{3}{u} - \frac{4}{v} = 4 \\ \frac{5}{u} - \frac{6}{v} = 7 \end{cases}$$

$$38. \begin{cases} \frac{4}{u} + \frac{3}{v} = 3 \\ \frac{6}{u} + \frac{5}{v} = 4 \end{cases}$$