HHA Key Concept 3 Review

Name: _____

Problems 1-8: Simplify each expression

1. $\frac{2}{7x}+\frac{4}{x^2}$

2. $\frac{11}{6x}+\frac{5}{2x^2}$

3. $\frac{2}{x+1}-\frac{3}{x+2}+\frac{8}{x^2+3x+2}$

4. $\frac{9}{x+4}+\frac{6}{x-4}-\frac{12}{x^2-16}$

5. $\frac{x^2-49}{x^2-4x-60}\cdot\frac{x^2+10x+24}{4x-28}$

6. $\frac{x^2+8x-9}{3x-12}\cdot\frac{x^2+5x-36}{x^2+x-2}$

7. $\frac{\frac{12}{x-4}}{\frac{1}{5}-\frac{3}{x-4}}$

8. $\frac{4x-20}{x^2+3x-40}\div\frac{8x+16}{x^2-64}$

Problems 9-16: Identify any holes, vertical and horizontal asymptotes for the following functions. Then find the x & y intercepts and graph each function.

9. $f(x)=\frac{(x-1)(x+3)}{(x+3)(x-6)}$

10. $f(x)=\frac{(x-2)(x+2)}{(x+1)(x-1)}$

11. $f(x)=\frac{4x-3}{x+1}$

12. $f(x)=\frac{-3x+2}{x-2}$

13. $f(x)=\frac{x^2-1}{x^2+5x+4}$

14. $f(x)=\frac{x^2+5x+6}{x^2-2x-8}$

15. $f(x)=\frac{3x^2-4x+1}{3x^2+5x-2}$

16. $f(x) = \dfrac{6x^2 + 13x - 5}{2x^2 + 9x + 10}$

Problems 17-22: Solve the rational equation and checking for extraneous solutions.

17. $\dfrac{2}{x} = \dfrac{x+7}{x}$

18. $\dfrac{x^2 - 3x - 4}{x+6} = \dfrac{50}{x+6}$

19. $\dfrac{2}{x+3} = 4 - \dfrac{2x}{x+3}$

20. $\dfrac{-1}{x-1} = x - \dfrac{x}{x-1}$

21. $\dfrac{1}{r-2} + \dfrac{1}{r^2 - 7r + 10} = \dfrac{6}{r-2}$

22. $\dfrac{7x}{x^2 - x - 12} = \dfrac{x}{x-4} - \dfrac{4}{x+3}$

Problems 23-25: Solve the system of rational equations algebraically or graphically.

23. $\begin{cases} y = \dfrac{6}{x+1} \\ y = x \end{cases}$

24. $\begin{cases} y = \dfrac{x}{x+2} \\ y = \dfrac{2x}{x-1} \end{cases}$

25. $\begin{cases} xy = 720 \\ x + y = 149 \end{cases}$