Applied Algebra 2
Chapter 9 Review

a·c
b

Name KEY

Simplify:

1. $\dfrac{x^2-16}{x^2+x-12}$ → -16, 4, -4, 0 ; -12, 4, -3, 1

$\dfrac{\cancel{(x+4)}(x-4)}{\cancel{(x+4)}(x-3)}$

$\boxed{\dfrac{(x-4)}{(x-3)}}$

2. $\dfrac{4x^2}{2x^2+3x}$

$\dfrac{4x^2}{x(2x+3)} =$

$\boxed{\dfrac{4x}{2x+3}}$

3. $\dfrac{x^2-2x-8}{x^2-5x+4}$ → -8, -4, 2, -2 ; 4, -4, -1, -5

$\dfrac{\cancel{(x-4)}(x+2)}{\cancel{(x-4)}(x-1)}$

$\boxed{\dfrac{(x+2)}{(x-1)}}$

Multiply then simplify.

4. $\dfrac{3x^2-12}{5x-10}\cdot\dfrac{1}{2x+4}$ → -4, 2, -2, 0

$\dfrac{3(x^2-4)}{5(x-2)}\cdot\dfrac{1}{2(x+2)}$

$\dfrac{3\cancel{(x+2)}\cancel{(x-2)}}{5\cancel{(x-2)}}\cdot\dfrac{1}{2\cancel{(x+2)}} =$

$\boxed{\dfrac{3}{10}}$

5. $\dfrac{4x^2y^3}{x^5y^6}\cdot\dfrac{xy}{20x^3} = \dfrac{4x^3y^4}{20x^8y^6} =$

$\boxed{\dfrac{1}{5x^5y^2}}$

6. $\dfrac{x^2-16}{x-9}\cdot\dfrac{x^2+x-90}{x^2+14x+40}$ → -90, 10, -9, 1 ; -16, 4, -4, 0 ; 40, 10, 4, 14

$\dfrac{\cancel{(x+4)}(x-4)}{\cancel{(x-9)}}\cdot\dfrac{\cancel{(x+10)}\cancel{(x-9)}}{\cancel{(x+10)}\cancel{(x+4)}}$

$\boxed{(x-4)}$

7. $\dfrac{x-8}{x^2-2x-48}\cdot\dfrac{4x^2+40x}{x+10}$ → -48, -8, 6, -2

$\dfrac{\cancel{(x-8)}}{\cancel{(x-8)}(x+6)}\cdot\dfrac{4x\cancel{(x+10)}}{\cancel{(x+10)}}$

$\boxed{\dfrac{4x}{(x+6)}}$

CH.9 REVIEW

8. $\frac{6x^2+7x+1}{7x+49} \div \frac{2x+2}{2x+14}$

6 6 1 7

$6x^2+6x+1x+1$

$6x(x+1)\,1(x+1)$

$\frac{(6x+1)(x+1)}{7(x+7)} \cdot \frac{2x+14}{2x+2}$

$\frac{(6x+1)\cancel{(x+1)}}{7\cancel{(x+7)}} \cdot \frac{\cancel{2}\cancel{(x+7)}}{\cancel{2}\cancel{(x+1)}} = \boxed{\frac{(6x+1)}{7}}$

9. $\frac{x}{x^2-4} \div \frac{5x^2}{x-2}$

-4 2 -2 0

$= \frac{x}{(x+2)\cancel{(x-2)}} \cdot \frac{\cancel{(x-2)}}{5x^2}$

$\boxed{\frac{1}{5x(x+2)}}$

10. $\frac{4y^2}{9x} \div \frac{16xy^2}{27}$

$\frac{\cancel{4y^2}^{1}}{\cancel{9x}_{1}} \cdot \frac{\cancel{27}^{3}}{\cancel{16xy^2}_{4}} = \boxed{\frac{3}{4x^2}}$

11. $(x+7) \div \frac{x^2+9x+14}{x^2+5x+6}$

6 2 3 5

$\frac{(x+7)}{1} \cdot \frac{x^2+5x+6}{x^2+9x+14}$

14 7 2 9

$\frac{\cancel{(x+7)}}{1} \cdot \frac{\cancel{(x+2)}(x+3)}{\cancel{(x+7)}\cancel{(x+2)}} =$

$\boxed{(x+3)}$

Add then simplify.

12. $\frac{6x^2+4x}{x+9} + \frac{8x+2x^2}{x+9}$

$\frac{6x^2+4x+8x+2x^2}{x+9} = \boxed{\frac{8x^2+12x}{x+9}}$

13. $\frac{9x}{x-4} + \frac{-3}{x+2}$ *LCD $= (x-4)(x+2)$

$\frac{9x(x+2)-3(x-4)}{(x-4)(x+2)} =$

$\frac{9x^2+18x-3x+12}{(x-4)(x+2)} = \boxed{\frac{9x^2+15x+12}{(x-4)(x+2)}}$

Subtract then simplify.

14. $\frac{7x+2}{x^2+7} - \frac{-6x-2}{x^2+7}$

$\frac{7x+2-(-6x-2)}{x^2+7}$

$\frac{7x+2+6x+2}{x^2+7} = \boxed{\frac{13x+4}{x^2+7}}$

15. $\frac{(2)12x}{(2)5x^4} - \frac{3x(5x)}{2x^3(5x)}$ *LCD $= 10x^4$

$\frac{24x-15x^2}{10x^4} =$

$\frac{3x(8-5x)}{10x^4} =$

$\boxed{\frac{3(8-5x)}{10x^3}}$

CH. 9 REVIEW

Solve the equation using any method. Check each solution.

16. $\frac{x}{x-3} = \frac{6}{x-3}$

$\frac{x}{\cancel{x-3}} = \frac{6}{\cancel{x-3}}$

$\boxed{x=6}$

17. $\frac{2}{x+1} = \frac{1}{x-2}$ *Cross multiply

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

$2x-4 = x+1$

$-x \quad -x$

$x-4=1$

$+4 \quad +4$

$\boxed{x=5}$

18. $\frac{3}{x-1} - 6 = \frac{5x}{x-1}$

$\frac{3}{\cancel{x-1}} - \frac{6(x-1)}{\cancel{x-1}} = \frac{5x}{\cancel{x-1}}$

$3-6x+6 = 5x$

$-6x+9 = 5x$

$+6x \quad +6x$

$\frac{9}{11} = \frac{11x}{11x}$

$\boxed{x = \frac{9}{11}}$

19. $\frac{-10}{x+7} = x$

$\frac{-10}{x+7} = \frac{x}{1}$ *Cross multiply

$-10(1) = x(x+7)$

$-10 = x^2+7x$

$+10 \quad +10$

$0 = x^2+7x+10 \rightarrow$ 10, 5, 2, 7

$0 = (x+5)(x+2)$

$\boxed{x=-5,-2}$

Simplify the complex fraction.

20. $\frac{\frac{6}{x-1}-3}{\frac{3}{x}}$

$\left(\frac{6}{x-1} - 3\right) \div \left(\frac{3}{x}\right)$

*LCD = x-1

$\left(\frac{6}{(x-1)} - \frac{3(x-1)}{(x-1)}\right) \div \left(\frac{3}{x}\right)$

$\left(\frac{6-3x+3}{x-1}\right) \cdot \left(\frac{x}{3}\right)$

$\frac{9-3x}{(x-1)} \cdot \frac{x}{3}$

$\frac{\cancel{3}(3-x)}{(x-1)} \cdot \frac{x}{\cancel{3}}$

$\boxed{\frac{x(3-x)}{(x-1)} \text{ OR } \frac{x(-x+3)}{(x-1)}}$

21. $\frac{\frac{x-3}{10x^5}}{\frac{x^2-9}{8x^3}} = \frac{x-3}{10x^5} \div \frac{x^2-9}{8x^3} =$

$\frac{x-3}{10x^5} \cdot \frac{8x^3}{x^2-9} \rightarrow$ -9, 3, -3, 0

$\frac{\cancel{(x-3)}}{\cancel{10x^5}_{5\ x^2}} \cdot \frac{\cancel{8}^{4}\cancel{x^3}^{1}}{(x+3)\cancel{(x-3)}}$

$\boxed{\frac{4}{5x^2(x+3)}}$