

Algebra 2CP Review Worksheet 6-7 Name _____

Answers

Rational Expressions & Complex Fractions Test Review

Simplify completely.

$$1. \frac{4x^3 - 23x^2 - 6x}{6x^2 - 37x + 6} = \frac{x(x-6)(4x+1)}{\cancel{(x-6)}(6x-1)} = \frac{x(4x+1)}{(6x-1)} //$$

$$\begin{aligned} & * 4x^3 - 23x^2 - 6x \\ & = x(4x^2 - 23x - 6) \\ & = x(x-6)(4x+1) \end{aligned}$$

$$2. \frac{2x+2y}{3x+3y} = \frac{2(x+y)}{3(x+y)} = \frac{2}{3}$$

$$3. \frac{17xy}{24z} \cdot \frac{12x}{34yz} = \frac{\underset{2}{17xy}(\underset{2}{12x})}{\underset{2}{34yz}(\underset{2}{24z})} = \frac{x^2}{4z^2}$$

$$4. \frac{52x^{10}y}{25a^3b^2} \cdot \frac{45a^5b^2}{13x^2y^5} = \frac{\overset{9}{45}a^3\overset{4}{x^8}b^2(52x^{10}y)}{\underset{5}{25}a^3b^2(\underset{y^4}{13x^2y^5})} = \frac{36a^3x^8}{5y^4}$$

$$5. \frac{b^2-81}{(b-9)^2} \cdot \frac{3b-27}{3b+27} = \frac{\cancel{(b+9)}\cancel{(b-9)}}{\cancel{(b-9)}\cancel{(b-9)}} \cdot \frac{\cancel{3}\cancel{(b-9)}}{\cancel{3}(b+9)} = 1$$

$$b^2 - 81 = (b+9)(b-9)$$

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$$6. \frac{x^2+x-42}{x^2-36} \cdot \frac{x^2-49}{x^2-x-42} = \frac{\cancel{(x+7)}\cancel{(x-6)}}{\cancel{(x+6)}\cancel{(x-6)}} \cdot \frac{\cancel{(x+7)}\cancel{(x-7)}}{\cancel{(x-7)}\cancel{(x+6)}} = \frac{(x+7)^2}{(x+6)^2} //$$

$$7. \frac{6y^2-17y+5}{10y^2-25y} \cdot \frac{30y^3+75y^2}{4y^2-25} = \frac{\cancel{(2y-5)}\cancel{(3y-1)}}{\cancel{5y}\cancel{(2y-5)}} \cdot \frac{\overset{3y}{\cancel{15y^2}}\cancel{(2y+5)}}{\cancel{(2y-5)}\cancel{(2y+5)}} = \frac{3y(3y-1)}{(2y-5)} //$$

$\begin{array}{r} 2y \quad -5 \\ \times \quad -1 \\ \hline 3y \end{array}$

$$8. \frac{p^2q}{pq^2} \div \frac{p^2}{q} = \frac{\cancel{p^2}\cancel{q}}{\cancel{p}q^{\cancel{2}}} \times \frac{q}{\cancel{p^2}} = \frac{1}{p} //$$

$$9. \frac{a^2+4a-45}{4a-36} \div \frac{a^2-81}{5a^2-45a} = \frac{(a+9)(a-5)}{4(a-9)} \div \frac{(a-9)(a+9)}{5a(a-9)}$$

$$= \frac{\cancel{(a+9)}\cancel{(a-5)}}{4\cancel{(a-9)}} \times \frac{5a\cancel{(a-9)}}{\cancel{(a-9)}\cancel{(a+9)}} = \frac{5a(a-5)}{4(a-9)} //$$

$$10. \frac{x^2-49}{2y^3} \div \frac{x+7}{8y^5} = \frac{\cancel{(x+7)}\cancel{(x-7)}}{\cancel{2}y^3} \times \frac{\overset{4y^2}{\cancel{8y^5}}}{\cancel{(x+7)}} = 4y^2(x-7) //$$

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$$11. \frac{x^2+3x}{x+2} + \frac{2x+6}{x+2} = \frac{x^2+5x+6}{x+2} = \frac{\cancel{(x+2)}(x+3)}{\cancel{(x+2)}} = x+3$$

$$12. \frac{7x+3}{x^2-1} - \frac{6}{x-1} = \frac{7x+3}{(x+1)(x-1)} - \frac{6(x+1)}{(x-1)(x+1)} = \frac{7x+3}{(x+1)(x-1)} - \frac{6x+6}{(x+1)(x-1)} = \frac{x-3}{(x+1)(x-1)}$$

$$13. \frac{7x+3}{x^2-1} - \frac{6x+4}{x^2-1} = \frac{\cancel{13}x-1}{x^2-1} = \frac{\cancel{x-1}}{(x+1)\cancel{(x-1)}} = \frac{1}{x+1} //$$

$$14. \frac{6y+13}{y^2-4y-21} - \frac{y-2}{y^2-4y-21} = \frac{6y+13-(y-2)}{y^2-4y-21} = \frac{5y+15}{y^2-4y-21} = \frac{5\cancel{(y+3)}}{\cancel{(y+3)}(y-7)} = \frac{5}{y-7} //$$

\downarrow $y^2-4y-21 = (y-7)(y+3)$
 \downarrow $y^2-4y-21$ same!

$$15. \frac{\frac{1}{y^2}-1}{1+\frac{1}{y}} = \frac{\frac{1-y^2}{y^2}}{\frac{y}{y} + \frac{1}{y}} = \frac{\frac{1-y^2}{y^2}}{\frac{y+1}{y}} = \frac{1-y^2}{y^2} \div \frac{y+1}{y}$$

$$= \frac{(1-y)\cancel{(1+y)}}{y^2} \times \frac{y}{\cancel{(y+1)}} = \frac{1-y}{y} //$$

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$$16. \frac{\frac{25}{a} - a}{5+a} = \frac{\frac{25 - a^2}{a}}{5+a} = \frac{25 - a^2}{a} \div 5+a = \frac{(5+a)(5-a)}{a} \times \frac{1}{(5+a)} = \frac{5-a}{a} //$$

$$17. \frac{4 + \frac{12}{2x-3}}{5 + \frac{15}{2x-3}} = \frac{\frac{4(2x-3) + 12}{(2x-3)}}{\frac{5(2x-3) + 15}{(2x-3)}} = \frac{8x - 12 + 12}{(2x-3)} = \frac{8x}{(2x-3)} \times \frac{2x-3}{10x} = \frac{4}{5} //$$

$$18. \frac{\frac{-5}{b-5} - 3}{\frac{10}{b-5} + 6} = \frac{\frac{-5 - 3(b-5)}{b-5}}{\frac{10 + 6(b-5)}{b-5}} = \frac{-5 - 3b + 15}{10 + 6b - 30} = \frac{-3b + 10}{b-5} = \frac{-(3b-10)}{(b-5)} \times \frac{(b-5)}{2(3b-10)} = -\frac{1}{2} //$$

$$19. \frac{\frac{x}{3x-2}}{9x^2-4} = \frac{x}{3x-2} \times \frac{9x^2-4}{x} = \frac{x}{(3x-2)} \cdot \frac{(3x-2)(3x+2)}{x} = 3x+2 //$$

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$$20. \frac{1 - \frac{12}{3x+10}}{x - \frac{8}{3x+10}} = \frac{\frac{3x+10}{3x+10} - \frac{12}{3x+10}}{\frac{x(3x+10)}{(3x+10)} - \frac{8}{(3x+10)}} = \frac{\frac{3x-2}{3x+10}}{\frac{3x^2+10x-8}{3x+10}} = \frac{\frac{(3x-2)}{(3x+10)}}{\frac{(x+4)(3x-2)}{(3x+10)}}$$

$$3x^2 - 10x - 8$$

$$= \frac{1}{3} \begin{matrix} +4 \\ \times \\ -2 \end{matrix}$$

$$= \frac{\cancel{3x-2}}{\cancel{3x+10}} \times \frac{\cancel{3x+10}}{(\cancel{3x-2})(x+4)} = \frac{1}{x+4} //$$

$$21. \frac{\frac{1}{2} - \frac{3}{a-2}}{\frac{2}{a} + \frac{5}{a-2}} = \frac{\frac{(a-2)}{a(a-2)} - \frac{3a}{a(a-2)}}{\frac{2(a-2)}{a(a-2)} + \frac{5a}{a(a-2)}} = \frac{\frac{-2a-2}{a(a-2)}}{\frac{7a-4}{a(a-2)}} = \frac{-2(a+1)}{\frac{7a-4}{a(a-2)}}$$

$$= \frac{-2(a+1)}{a(a-2)} \times \frac{a(a-2)}{7a-4} = \frac{-2(a+1)}{7a-4} //$$

$$22. \frac{\frac{12}{c+5} - \frac{4}{c-5}}{\frac{8c}{c^2-25}} = \frac{\frac{12c-60}{(c+5)(c-5)} - \frac{4c+20}{(c+5)(c-5)}}{\frac{8c}{(c+5)(c-5)}} = \frac{\frac{8c+80}{(c+5)(c-5)}}{\frac{8c}{(c+5)(c-5)}}$$

$$= \frac{8c+80}{(c+5)(c-5)} \div \frac{8c}{(c+5)(c-5)} = \frac{8(c+10)}{(c+5)(c-5)} \times \frac{(c+5)(c-5)}{8c}$$

$$= \frac{8(c+10)}{8c} //$$