

2-6 HW Answer Key

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

5.  $\frac{4x-3}{2x-1}$

10.  $\frac{(x+3)}{(x+5)}$

2.  $\frac{2(x-2)}{x+5}$

6.  $\frac{3(2x-5)}{x}$

11.  $\frac{(x+2)^2}{(3x-4)(x+4)}$

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

7.  $\frac{(x+3)}{(x)(x+4)}$

12.  $\frac{x+3}{3}$

4.  $\frac{y^5}{8x^2}$

8.  $\frac{(x+1)}{(x-1)}$

13. See next page

9.  $3(x+2)$

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## Alg 2 Homework 2-6

Name Key (2016)Multiply. Assume that all expressions are defined.

1.  $\frac{x-2}{2x-3} \cdot \frac{4x-6}{x^2-4}$

$$\frac{\cancel{x-2}}{\cancel{2x-3}} \cdot \frac{2(\cancel{2x-3})}{(x-2)(x+2)} = \boxed{\frac{2}{x+2}}$$

2.  $\frac{x-2}{x-3} \cdot \frac{2x-6}{x+5}$

$$\frac{\cancel{x-2}}{\cancel{x-3}} \cdot \frac{2(\cancel{x-3})}{x+5} = \boxed{\frac{2(x-2)}{x+5}}$$

3.  $\frac{x^2-16}{x^2-4x+4} \cdot \frac{x-2}{x^2+6x+8}$

$$\frac{(\cancel{x+4})(x-4)}{(x-2)(\cancel{x-2})} \cdot \frac{\cancel{x-2}}{(x+2)(x+4)} = \boxed{\frac{x-4}{(x-2)(x+2)}}$$

4.  $\frac{x^2-4}{4x^2} \cdot \frac{8y^5}{2x^2}$

$$\frac{\cancel{x^2-4}}{4\cancel{x^2}} \cdot \frac{\cancel{8}y^5}{2\cancel{x^2}} = \boxed{\frac{y^5}{8x^2}}$$

5.  $\frac{4x^2-3x}{4x^2-1} \cdot \frac{2x+1}{x}$

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

6.  $\frac{4x^2-20x+25}{x^2-4x} \cdot \frac{3x-12}{2x-5}$

$$\frac{(2x-5)(\cancel{2x-5})}{x(\cancel{x-4})} \cdot \frac{3(\cancel{x-4})}{\cancel{2x-5}} = \boxed{\frac{3(2x-5)}{x}}$$

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$$7. \frac{4x^2+15x+9}{8x^2+10x+3} \div \frac{x^2+4x}{2x+1}$$

$$\frac{4x^2+15x+9}{8x^2+10x+3} \cdot \frac{2x+1}{x^2+4x}$$

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

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

$$8. \frac{x^2-4x-5}{x^2-3x+2} \div \frac{x^2-3x-10}{x^2-4}$$

$$\frac{x^2-4x-5}{x^2-3x+2} \cdot \frac{x^2-4}{x^2-3x-10}$$

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

$$\boxed{\frac{x+1}{x-1}}$$

$$9. \frac{x+2}{x-4} \div \frac{1}{3x-12}$$

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

$$\boxed{3(x+2)}$$

$$10. \frac{x^2-2x-3}{x^2-x-2} \div \frac{x^2+2x-15}{x^2+x-6}$$

$$\frac{x^2-2x-3}{x^2-x-2} \cdot \frac{x^2+x-6}{x^2+2x-15}$$

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

$$\boxed{\frac{x+3}{x+5}}$$

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Multiply or divide. Simplify if possible. Assume all fractions are defined.

$$11. \frac{x^2-2x-8}{9x^2-16} \cdot \frac{3x^2+10x+8}{x^2-16}$$

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

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

$$12. \frac{3x^2+7x-6}{3x-12} \div \frac{6x^2-x-2}{2x^2-7x-4}$$

$$\frac{3x^2+7x-6}{3x-12} \cdot \frac{2x^2-7x-4}{6x^2-x-2}$$

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

$$\boxed{\frac{x+3}{3}}$$

13. Show why dividing by a fraction is the same as multiplying by its reciprocal.

$$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$

$$\frac{\left(\frac{a}{1}\right) \frac{a}{b}}{\left(\frac{1}{1}\right) \frac{c}{d}} = \frac{ad}{bc}$$

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Review Activity Answer Key

Update problem #4a in packet:

$$\frac{2}{x-3} + \frac{x+5}{3-x}$$

1.  $\frac{2}{3}, x \neq 0, -5$

2.  $-(x-4)$  or  $-x+4$

3.  $\frac{(x+1)}{(x+4)}$

4.  $\frac{-x-3}{x-3}$

5.  $\frac{-x+12}{18}$

6.  $x^2+3$

7.  $\{8\}$

8.  $\{\}$  or  $\emptyset$

9.  $\frac{(x)(x+5)}{(x+4)}, x \neq \pm 4$   
 b) also  $x \neq 0$

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| <p>1a) Simplify and identify any x-values for which the expression is undefined.</p> $\frac{2x^2 + 10x}{3x^2 + 15x}$ $\frac{2x(x+5)}{3x(x+5)} = \frac{2}{3}$ <p><math>x \neq 0, -5</math></p> | <p>2a) Multiply: <math>\frac{x^2-16}{9-x} \cdot \frac{x^2+x-90}{x^2+14x+40}</math></p> $\frac{(x-4)(x+4)}{9-x} \cdot \frac{(x+10)(x-4)}{(x+6)(x+4)}$ $\frac{-1(x-4)}{-x+4}$ <p>or</p> $-x+4$                             |
| <p>3a) Divide: <math>\frac{x^2+2x-3}{x^2-9} \div \frac{x^2+3x-4}{x^2-2x-3}</math></p> $\frac{(x+3)(x-1)}{(x+3)(x-3)} \cdot \frac{(x-3)(x+1)}{(x+4)(x-1)}$ $\frac{x+1}{x+4}$                   | <p>4a) Add. Simplify if possible.</p> $\frac{2}{x-3} + \frac{x+5}{3-x}$ $\frac{-x-3}{x-3}$                                                                                                                               |
| <p>5a) Subtract. Simplify if possible.</p> $\frac{2}{2} \cdot \frac{3x+6}{9} - \frac{7x}{18}$ $\frac{6x+12}{18} - \frac{7x}{18}$ $\frac{-x+12}{18}$                                           | <p>6a) Simplify the complex fraction.</p> $\frac{\left(\frac{2x}{1}\right) \cdot \frac{1}{3} \cdot \frac{1}{x} \cdot \left(\frac{2x}{1}\right)}{\frac{1}{3x} \cdot \left(\frac{2x}{1}\right)}$ $\frac{x^2+3}{1}$ $x^2+3$ |

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| <p>7a) Solve: <math>\frac{15}{4} = \frac{6}{x} + 3</math> <math>x \neq 0</math></p> $\frac{4x}{1} \left( \frac{15}{4} \right) = \frac{4x}{1} \left( \frac{6}{x} \right) + \frac{4x}{1} (3)$ $15x = 24 + 12x$ $3x = 24$ $x = 8$ $\{8\}$    | <p>8a) Solve: <math>\frac{4}{x^2-4} = \frac{1}{x-2}</math> <math>x \neq \pm 2</math></p> $x^2 - 4 = 4(x-2)$ $x^2 - 4 = 4x - 8$ $x^2 - 4x + 4 = 0$ $(x-2)^2 = 0$ $x-2 = 0$ $x = 2 \quad \{2\}$ <p>or</p> $\left( \frac{x-2}{1} \right) \left( \frac{4}{(x+2)(x-2)} \right) = \frac{1}{x-2} \left( \frac{x-2}{1} \right)$ $4 = x+2$ $2 = x \quad \{2\}$ |
| <p>9a) Simplify and identify any x-values for which the expression is undefined.</p> $\frac{x^3 + x^2 - 20x}{x^2 - 16}$ $\frac{x(x^2 + x - 20)}{(x-4)(x+4)}$ $\frac{x(x+5)(x-4)}{(x-4)(x+4)} \quad x \neq 4$ $\boxed{\frac{x(x+5)}{x+4}}$ |                                                                                                                                                                                                                                                                                                                                                       |

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| <p>1b) Simplify and identify any x-values for which the expression is undefined.</p> $\frac{4x^3 + 20x^2}{6x^2 + 30x^2}$ $\frac{2x^2(x+5)}{6x^2(x+5)} = \boxed{\frac{2}{3}}$ $x \neq -5, 0$         | <p>2b) Multiply: <math>\frac{x^3 - 2x - 8}{8 - x} \cdot \frac{x^2 + 2x - 80}{x^2 + 12x + 20}</math></p> $\frac{(x-4)(x+2)}{8-x} \cdot \frac{(x+6)(x-4)}{(x+6)(x+2)}$ $\boxed{\frac{-1(x-4)}{-x+5}}$ <p>or</p> $\boxed{\frac{-x+4}{-x+5}}$ |
| <p>3b) Divide: <math>\frac{x^2 - 2x - 3}{x^2 + 2x - 15} \div \frac{x^2 - x - 20}{x^2 - 25}</math></p> $\frac{(x-3)(x+1)}{(x+5)(x-3)} \cdot \frac{(x-5)(x+5)}{(x-5)(x+4)}$ $\boxed{\frac{x+1}{x+4}}$ | <p>4b) Add. Simplify if possible.</p> $\frac{-1}{x-3} + \frac{2x-7}{3-x} + \frac{x-10}{x-3}$ $\frac{-2x+7}{x-3} + \frac{x-10}{x-3}$ $\boxed{\frac{-x-3}{x-3}}$                                                                            |
| <p>5b) Add. Simplify if possible.</p> $\frac{2x+4}{36} + \frac{-x+5}{9} \cdot 4$ $\frac{2x+4}{36} + \frac{-4x+20}{36}$ $\frac{-2x+24}{36}$ $\boxed{\frac{-x+12}{18}}$                               | <p>6b) Simplify the complex fraction.</p> $\left( \frac{3x}{1} \right) \frac{x+1}{x} \left( \frac{3x}{1} \right)$ $\frac{1}{3x} \left( \frac{8x}{1} \right)$ $\frac{x^2+3}{1}$ $\boxed{x^2+3}$                                            |

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| <p>7b) Solve: <math>\frac{5}{4} - \frac{x}{x-4} = \frac{-3}{x-4}</math></p> $\frac{4}{1} \left( \frac{x-4}{1} \right) \left( \frac{5}{4} \right) - \frac{4}{1} \left( \frac{x-4}{1} \right) \left( \frac{x}{x-4} \right) = \frac{-3}{1} \left( \frac{4}{1} \right) \left( \frac{x-4}{1} \right)$ $5(x-4) - 4x = -12$ $5x - 20 - 4x = -12$ $x = 8$ $\{8\}$ <p>OR: <math>\frac{5}{4} = \frac{-3}{x-4} + \frac{x}{x-4}</math></p> $\frac{5}{4} = \frac{x-3}{x-4}$ $5x - 20 = 4x - 12$ $x = 8$ $\{8\}$ | <p>8b) Solve: <math>\frac{4x}{x-4} = \frac{2x+8}{x-4}</math> <math>x \neq 4</math></p> $\left( \frac{x-4}{1} \right) \frac{4x}{x-4} = \frac{2x+8}{x-4} \left( \frac{x-4}{1} \right)$ $4x = 2x + 8$ $2x = 8$ $x = 4$ $\{ \}$ <p>OR: <math>4x(x-4) = (2x+8)(x-4)</math></p> $4x^2 - 16x = 2x^2 - 32$ $2x^2 - 16x + 32 = 0$ $x^2 - 8x + 16 = 0$ $(x-4)^2 = 0$ $x-4 = 0$ $x = 4$ $\{ \}$ |
| <p>9b) Simplify and identify any x-values for which the expression is undefined.</p> $\frac{x^7 + x^6 - 20x^5}{x^5 - 16x^4}$ $\frac{x^5(x^2 + x - 20)}{x^4(x^2 - 16)}$ $\frac{x^5(x+5)(x-4)}{x^4(x+4)(x-4)}$ $\frac{x(x+5)}{x+4}$ $x \neq \pm 4, 0$                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                      |

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