

4 pts ea

1. Multiply the given polynomials and simplify by combining all like terms.

a)  $(x-7)(x-3)$

$$x^2 - 10x + 21$$

b)  $(5x+3)(7x-2)$

$$35x^2 + 11x - 6$$

c)  $(3x-2)(3x^2-2x+5)$

$$9x^3 - 6x^2 + 15x - 6x^2 + 4x - 10$$

$$9x^3 - 12x^2 + 19x - 10$$

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2. Simplify by removing parentheses and combining like terms:

a)  $5(5x-2y) - 3(8x-5y) + 2x + 3y$

$$25x - 10y - 24x + 15y + 2x + 3y$$

$$3x + 8y$$

b)  $(x-5)^2 - (x+3)(x-3) - x + 2$

$$x^2 - 10x + 25 - x^2 + 9 - x + 2$$

$$-11x + 36$$

3. Factor each expression completely.

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a)  $x^2 + 2x - 35$

$(x+7)(x-5)$

b)  $4x^2 - 21x + 5$

$(4x-1)(x-5)$

c)  $x^2 - 100$

$(x+10)(x-10)$

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d)  $x^4 - 8x^2 + 16$

$(x^2 - 4)(x^2 - 4)$

"

$(x+2)(x-2)(x+2)(x-2)$

OR

$(x+2)^2(x-2)^2$

e)  $6x^3 + 9x^2 - 15x$

$3x(2x^2 + 3x - 5)$

$3x(2x+5)(x-1)$

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4. Reduce each rational expression to lowest terms.

$(x-2)(x-5)$

a)  $\frac{x^2 - 7x + 10}{x^2 + x - 30}$

$(x+6)(x-5)$

$\frac{x-2}{x+6}$

$\frac{3(x+4)(x-1)}{6(x^2 + 3x - 4)}$

b)  $\frac{6x^2 + 18x - 24}{2x^2 - 32}$

$2(x^2 - 16)$

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

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

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5. Multiply or divide as indicated and simplify your answer:

$$\text{a) } \frac{\cancel{x}}{x^2 - 16} \cdot \frac{\cancel{(x+4)}}{10x} = \frac{1}{10(x-4)}$$

~~(x+4)(x-4)~~

$$\text{b) } \frac{\cancel{(x-2)}\cancel{(x-3)}}{x^2 - 4} \cdot \frac{\cancel{(x-5)}\cancel{(x+2)}}{x^2 - 3x - 10} = \frac{x-5}{x+4}$$

~~(x+2)(x-2)~~     ~~(x+4)(x-3)~~

$$\text{c) } \frac{6x^2 - 6}{x^2 + 3x + 2} \div \frac{x-1}{x^2 + 4x + 4}$$

~~6(x+1)(x-1)~~  
~~6(x^2-1)~~  
~~(x+1)(x+2)~~     ~~(x+2)(x+2)~~

↓

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

6. Solve each equation. Show your work to receive credit!!! Write your answer as a fraction, NOT as a decimal.

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a)  $5x = 20$

$x = 4$

b)  $x + 8 = 20$

$x = 12$

c)  $3x - 7 = 10$

$3x = 17$   
 $x = \frac{17}{3}$

6 pts d)  $2x - 3(4 - 3x) = 5 - 2(10x + 4) + x$

$2x - 12 + 9x = 5 - 20x - 8 + x$

$11x - 12 = -3 - 19x$

$+19x + 12 \quad +12 + 19x$

$30x = 9, \quad x = \frac{9}{30} \text{ or } \frac{3}{10}$

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7)  $20 \cdot \left( \frac{x+2}{5} + 3 \right) = \left( \frac{x-5}{4} \right) \cdot 20$

$4(x+2) + 60 = 5(x-5)$

$4x + 8 + 60 = 5x - 25$

$4x + 68 = 5x - 25$

$-5x - 68 \quad -5x - 68$

$-x = -93$

$x = 93$

6 pts 7)  $\frac{7x}{2(x-3)} + \frac{5}{x+4} = \frac{7}{2} \rightarrow x \neq 3, -4$

$2(x-3)(x+4) \left[ \quad \right] = \frac{7}{2} \cdot 2(x-3)(x+4)$

$7x(x+4) + 5 \cdot 2 \cdot (x-3) = 7(x-3)(x+4)$   
 $(x^2 + x - 12)$

$7x^2 + 28x + 10x - 30 = 7x^2 + 7x - 84$   
 $-7x^2 - 7x \quad +30 \quad -7x^2 - 7x + 30$

$31x = -54$

$x = -\frac{54}{31}$