

Review

1. Multiply.  $(2x^2 - 3x + 1)(x - 3)$

$$2x^3 - 6x^2 - 3x^2 + 9x + x - 3$$

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

2. Add.  $\frac{x}{2} - \frac{3x}{3}$

$$\frac{x}{2} - \frac{x \cdot 2}{1 \cdot 2}$$

$$\frac{x \cdot 3}{2 \cdot 3} - \frac{3x \cdot 2}{3 \cdot 2}$$

$$\frac{x - 2x}{2} = \frac{-x}{2}$$

$$\frac{3x - 6x}{6} = \frac{-3x}{6} = \boxed{\frac{-x}{2}}$$

- |      |       |
|------|-------|
| 1. J | 6. M  |
| 2. N | 7. D  |
| 3. F | 8. B  |
| 4. P | 9. C  |
| 5. O | 10. L |

11.  $\frac{z^{18}}{x^9 y^{12}}$

12.  $(x^{-1} y^2)^2 (x^2 y^{-4})^{-3}$

$$x^{-2} y^4 x^{-6} y^{12}$$

$$x^{-8} y^{16} = \boxed{\frac{y^{16}}{x^8}}$$

$$(x^m)^n = x^{mn}$$

$$x^m x^n = x^{m+n}$$

13. lead term:  $-4x^6$   
 leading coeff:  $-4$   
 degree:  $6$   
 constant term:  $7$

14.  $-5$

15.  $6x^3 + x^2 - 3x - 5$

16.  $2x^4 + 2x^3 - 16x^2 + 8x$

17. quotient:  
 $3x^2 + 4x - 2$   
 rem.:  $1$

18.  $3x^6 - 15x^4 - 18x^2$

$3x^2(x^4 - 5x^2 - 6)$

$3x^2[x^4 + x^2 - 6x^2 - 6]$

$3x^2[x^2(x^2 + 1) - 6(x^2 + 1)]$

$3x^2(x^2 + 1)(x^2 - 6)$

19.  $27x^3 + 8$

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

$(3x+2)(9x^2 - 6x + 4)$

20. Solve.  $(x-3)^2 = 24 - 4x$

$(x-3)(x-3)$   ~~$x^2 - 9$~~   
 $x^2 - 6x + 9$   ~~$x^2 + 9$~~

$x^2 - 6x + 9 + 4x - 24 = 0$

$x^2 - 2x - 15 = 0$

$x - 5 = 0, x + 3 = 0$

$(x-5)(x+3) = 0$

$x = 5, -3$

$x^4 + 3x^3a = 24a + 8x$

$x^4 + 3x^3a - 24a - 8x = 0$

$x + 3a = 3a + x$

$x^3(x + 3a) - 8(3a + x) = 0$

$(x + 3a)(x^3 - 8) = 0$

$x + 3a = 0$

$x^3 - 8 = 0$

$(x-2)(x^2 + 2x + 4) = 0$

$x = -3a$

$x^3 = 8$   
 $x = 2$

$x - 2 = 0$   
 $x = 2$

~~$x^2 + 2x + 4 = 0$~~

$$14. P(x) = -2x^2 - x + 10$$

$$\begin{aligned} P(-3) &= -2(-3)^2 - (-3) + 10 \\ &= -2(9) + 3 + 10 \\ &= -18 + 13 = \boxed{-5} \end{aligned}$$

### 6.2 Dividing Rational Expressions

$$34. \frac{(4x)^2 - 3^2}{6 - 5x - 4x^2} \div \frac{4x(4x+3) + 3(4x+3)}{16x^2 + 24x + 9}$$

$$\frac{-(4x^2 + 5x - 6)}{-(4x^2 + 8x - 3x - 6)} \div \frac{4x^2 + 11x + 6}{4x^2 + 8x + 3x + 6}$$

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

$$\frac{16}{9} = \frac{4 \cdot 4 \cdot 3 \cdot 3}{3 \cdot 3}$$

$$\frac{4}{6} = \frac{2 \cdot 2 \cdot 3 \cdot 2}{2 \cdot 3}$$

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

$x \neq -2, -3/4, 3/4$

$$36. \frac{x^{4n}-1}{x^{2n}+x^n-2} \cdot \frac{x^{2n}+1}{x^{2n}+3x^n+2}$$

$$\frac{\cancel{(x^n-1)}\cancel{(x^n+1)}}{\cancel{(x^{2n}-1)}\cancel{(x^{2n}+1)}} \cdot \frac{\cancel{(x^n+2)}\cancel{(x^n+1)}}{\cancel{x^{2n}+1}}$$

$$= (x^n+1)(x^n+1) = x^{2n} + 2x^n + 1$$

$$\begin{aligned} x^n+2 &\neq 0 \\ x^n-1 &\neq 0 \\ x^n+1 &\neq 0 \end{aligned}$$

$$50. \frac{2(y-2)}{5xy^2} + \frac{3-2x}{10x^2y}$$

$5 \cdot x \cdot y \cdot y$       $2 \cdot 5 \cdot x \cdot x \cdot y$   
 $10x^2y^2$

$$\frac{4x(y-2)}{(5xy^2) \cdot 2x} + \frac{(3-2x)}{(10x^2y) \cdot y}$$

$$\frac{4xy-8x}{10x^2y^2} + \frac{3y-2xy}{10x^2y^2} = \frac{4xy-8x+3y-2xy}{10x^2y^2}$$

$$\boxed{\frac{2xy-8x+3y}{10x^2y^2} ; x, y \neq 0}$$

$$64. \frac{1}{x+2} - \frac{3x}{x^2+4x+4}$$

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

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

$$= \frac{x+2 - 3x}{(x+2)(x+2)} = \frac{-2x+2}{(x+2)(x+2)} = \frac{-2(x-1)}{(x+2)(x+2)}, \quad x \neq -2$$

$$= \frac{-2x+2}{x^2+4x+4}$$

$$74. \frac{x+1}{x^2+x-12} - \frac{x-3}{x^2+7x+12}$$

(x+4)(x-3)      (x+4)(x+3)

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

$$x^2 + 3x + x + 3 - (x^2 - 3x - 3x + 9)$$

$$\frac{10x-6}{(x+4)(x-3)(x+3)} = \frac{2(5x-3)}{(x+4)(x-3)(x+3)}, \quad x \neq -4, 3, -3$$

$$80. \frac{2x(x-1)}{(x-5)(x+3)} - \frac{2}{x+3} + \frac{x}{5-x}$$

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

$$= \frac{2x^2 - 2x - (2x - 10) - (x^2 + 3x)}{(x-5)(x+3)}$$

$$= \frac{x^2 - 7x + 10}{(x-5)(x+3)} = \frac{\cancel{(x-5)}(x-2)}{\cancel{(x-5)}(x+3)} = \frac{x-2}{x+3}, x \neq -3, 5$$

6.2 HW

31-37 divide  
\*69-83 add/subtr.