

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

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

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

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

$$(x-3)(x-3) \quad \cancel{x^2 - 9}$$

$$x^2 - 6x + 9 \quad \cancel{x^2 + 9}$$

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

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

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

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

$$x=5, -3$$

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

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

$$x+3a=3a+x$$

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

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

$$x+3a=0$$

$$x^3-8=0$$

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

$$x = -3a$$

$$x^3=8$$

$$x=2$$

$$x-2=0$$

$$x=2$$

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

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

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

6.2 Dividing Rational Expressions

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

$$\frac{6 - 5x - 4x^2}{4x^2 + 11x + 6}$$

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

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

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

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

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

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

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

$$= (x^n+1)(x^n+1) =$$

$$x^{2n}+2x^n+1,$$

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

$$50. \frac{2y-4}{5xy^2} + \frac{3-2x}{10x^2y} = \frac{2(y-2)}{5xy^2} + \frac{3-2x}{10x^2y}$$

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

$$\frac{5 \cdot x \cdot y \cdot y}{10x^2y^2} = LCD$$

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

$$\begin{array}{cc} 6 & \& 8 \\ \underline{2 \cdot 3} & & \underline{2 \cdot 2 \cdot 2} \end{array}$$

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

$$LCM=24$$

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

$$\begin{aligned}
 64. \quad & \frac{1}{x+2} - \frac{3x}{x^2+4x+4} \\
 &= \frac{1}{x+2} - \frac{3x}{(x+2)(x+2)} \\
 &= \frac{1}{x+2} \cdot \frac{x+2}{x+2} - \frac{3x}{(x+2)(x+2)} \\
 &= \frac{x+2-3x}{(x+2)(x+2)} = \frac{-2x+2}{(x+2)(x+2)} = \frac{-2(x-1)}{(x+2)^2} \\
 &= \frac{-2x+2}{x^2+4x+4}, \quad x \neq -2
 \end{aligned}$$

$$\begin{aligned}
 74. \quad & \frac{x+1}{x^2+x-12} - \frac{x-3}{x^2+7x+12} \\
 &= \frac{x+1}{(x-3)(x+4)} - \frac{x-3}{(x+3)(x+4)} \\
 &= \frac{x+1}{(x-3)(x+4)} \cdot \frac{x+3}{x+3} - \frac{x-3}{(x+3)(x+4)} \cdot \frac{x-3}{x-3} \\
 &= \frac{x^2+4x+3}{(x-3)(x+4)(x+3)} - \frac{x^2-6x+9}{(x+3)(x+4)(x-3)} \\
 &= \frac{10x-6}{(x-3)(x+4)(x+3)} = \frac{2(5x-3)}{(x-3)(x+4)(x+3)}, \quad x \neq 3, -3, -4
 \end{aligned}$$

6.2 HW

~~31-83 add~~

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