WRH 2 Solutions

1.3: 13, 21, 29, 43, 47, 56, 66, 89, 107
1.4: 2, 13, 23, 27, 40
1.5: 1, 9, 16, 28, 37, 47

1.3

13. $P: -4x^{10} - x^{13} + 9 + 7x^{11} = \boxed{-x^{13} + 7x^{1} - 4x^{10} + 9}$

(a) $\boxed{\deg(P) = 13}$

(b) $\boxed{a = -1}$

21. $(-4x^3y + 2xz - 3y) - (2xz + 3y + x^2z) =$

$= -4x^3y + 2xz - 3y - 2xz - 3y - x^2z =$

$= \boxed{-4x^3y - 6y - x^2z}$

29. $(3a^2b + 2a - 3b)(ab^2 + 7ab) =$

$= 3a^2b \cdot ab^2 + 3a^2b \cdot 7ab + 2a \cdot ab^2 + 2a \cdot 7ab -$
$- 3b \cdot ab^2 - 3b \cdot 7ab = \boxed{3a^3b^3 + 21a^3b^2 + 2a^2b^2 +}$
$\boxed{+ 14a^2b - 3ab^3 - 21ab^2}$

43. $(-x - 2y)^2 = (-(x + 2y))^2 = (x + 2y)^2 =$

$= \boxed{x^2 + 4xy + 4y^2}$

47. $4m^2n + 16m^3 + 7m = \boxed{m(4mn + 16m^2 + 7)}$

56. $(2x + y^2)^4 - (2x + y^2)^6 = \boxed{(2x + y^2)^4(1 - (2x + y^2)^2)}$

66. $64z^3 + 216 = (4z)^3 + 6^3 =$

$= (4z + 6)((4z)^2 - 24z + 36) =$

$= 2(2z + 3)(16z^2 - 24z + 36) = \boxed{8(2z + 3)(4z^2 - 6z + 9)}$

89. $x^2 + 13x + 22 = x^2 + 2x + 11x + 22 =$

$= x(x + 2) + 11(x + 2) = \boxed{(x + 11)(x + 2)}$

107. $10y^{-2} - 2y^{-5}x = \boxed{2y^{-5}(5y^3 - x)}$

1.4

2. $\frac{x^2+5x-6}{x^3+2x^2-3x} = \frac{x^2+5x-6}{x(x^2+2x-3)} = \frac{x^2+5x-6}{x(x+3)(x-1)} =$

$x \neq 0 \quad , \quad x \neq -3, \quad x \neq 1$

$= \frac{(x+6)(x-1)}{x(x+3)(x-1)} = \frac{x+6}{x(x+3)}$

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

$= \frac{x^2-6x+9+x^3+5x^2+3x^2+15x+2x+10}{(x+5)(x-3)} =$

$= \frac{x^3+9x^2+11x+19}{(x+5)(x-3)}$

23. $\frac{y-2}{y+1} \cdot \frac{y^2-1}{y-2} = \frac{(y-2)(y-1)(y+1)}{(y+1)(y-2)} = y-1$

27. $\frac{y^2-11y+24}{y+6} : \frac{y^2+5y-24}{y+6} =$

$= \frac{(y-8)(y-3)}{(y+8)} \cdot \frac{(y+6)}{(y+8)(y-3)} = \frac{y-8}{y+8}$

40. $\frac{\frac{1}{y} - \frac{1}{x+3}}{\frac{1}{x} - \frac{y}{x^2+3x}} = \frac{\frac{x+3-y}{y(x+3)}}{\frac{x(x+3)-xy}{x(x+3)x}} =$

$= \frac{(x+3-y)}{y(x+3)} : \frac{x(x+3)\cdot x}{x(x+3-y)} = \frac{x}{y}$

1.5

1. $\sqrt{-25} = \sqrt{i^2 \cdot 5^2} = \boxed{5i}$

9. $(4-2i)-(3+i) = (4-3)+(-2i-i) = \boxed{1-3i}$

16. $(5+i)(2-9i) = 10-45i+2i+9 = \boxed{19-43i}$

28. $(-5i)^3 = -125 \cdot i^3 = \boxed{125i}$

37. $\frac{52}{5+i} = \frac{52\cdot(5-i)}{(5+i)(5-i)} = \frac{52\cdot(5-i)}{25+1} =$

$= \frac{52(5-i)}{26} = 2(5-i) = \boxed{10-2i}$

47. $\frac{\sqrt{-98}}{3i\sqrt{-2}} = \frac{i\sqrt{2\cdot 49}}{3\cdot i^2\sqrt{2}} = \frac{7i\sqrt{2}}{-3\sqrt{2}} = \boxed{-\frac{7}{3}i}$