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(1) $2x^5 + 6x^4 + 4x^3 = 2x^3(x^2 + 3x + 2)$

Three Terms
$2x^5$, $6x^4$, $4x^3$
Common Factor
$2x^3$

(3) $(A + B)^2 =$ A^2 + 2AB + B^2

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

(5) $A^2 - B^2 = (A-B)(A+B)$

$4x^2 - 25 = (2x-5)(2x+5)$

		Type	Terms	Degree
(7)	$x^2 - 3x + 7$	Trinomial	$x^2, -3x, 7$	Two
(9)	-8	Monomial	-8	zero
(11)	$x - x^2 + x^3 - x^4$	Four Terms	$x, -x^2, x^3, -x^4$	Four

(13) $(12x - 7) - (5x - 12)$

$= 7x + 5$

(15) $(3x^2 + x + 1) + (2x^2 - 3x - 5)$

$= 5x^2 - 2x - 4$

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(17) $(x^3 + 6x^2 - 4x + 7) - (3x^2 + 2x - 4)$

$= \boxed{x^3 + 3x^2 - 6x + 11}$

(19) $8(2x + 5) - 7(x - 9)$

$= 16x + 40 - 7x + 63$

$= \boxed{9x + 103}$

(21) $2(2 - 5t) + t^2(t - 1) - (t^4 - 1)$

$= 4 - 10t + t^3 - t^2 - t^4 + 1$

$= \boxed{-t^4 + t^3 - t^2 - 10t + 5}$

(23) $(3t - 2)(7t - 4)$

$= \boxed{21t^2 - 2t + 8}$

(25) $(3x + 5)(2x - 1)$

$= \boxed{6x^2 + 7x - 5}$

(27) $(x + 3y)(2x - y)$

$= \boxed{2x^2 + 5xy - 3y^2}$

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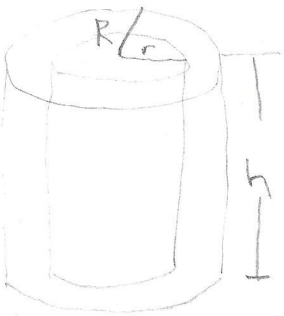
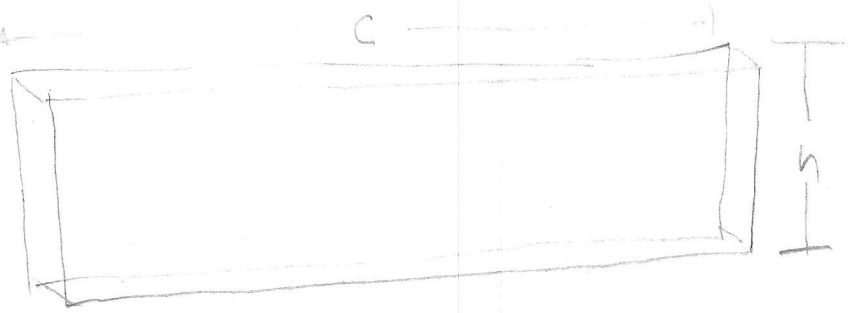
(131)

$$V = \pi R^2 h - \pi r^2 h$$

$$V = \pi h (R^2 - r^2)$$





$$C = \frac{2\pi}{r}$$

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(29) $(3x+4)^2$

$= \boxed{9x^2 + 24x + 16}$

(31) $(2u+v)^2$

$= \boxed{4u^2 + 4uv + v^2}$

(33) $(2x+3y)^2$

$= 4x^2 + 12xy + 9y^2$

(35) $(x+5)(x-5)$

$= \boxed{x^2 - 25}$

(37) $(3x-4)(3x+4)$

$= \boxed{9x^2 - 16}$

(39) $(\sqrt{x}+2)(\sqrt{x}-2)$ note: $(\sqrt{x})(\sqrt{x}) = x$

$= \boxed{x - 4}$

(40) $(\sqrt{y}+\sqrt{2})(\sqrt{y}-\sqrt{2})$

$= \boxed{y - 2}$

(41) $(y+2)^3 = (y+2)(y+2)(y+2)$

$= (y^2+4y+4)(y+2)$

$= y^3 + 4y^2 + 4y + 2y^2 + 8y + 8$

$= \boxed{y^3 + 6y^2 + 12y + 8}$

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(43) $(1-2r)^3 = (1-4r+4r^2)$

$= 4r^2 - 4r + 1$

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

$= x^3 + 2x^2 + 3x$

$\quad + 2x^2 + 4x + 6$

$= \boxed{x^3 + 4x^2 + 7x + 6}$

(47) $(2x-5)(x^2-x+1)$

$= 2x^3 - 2x^2 + 2x$

$\quad - 5x^2 + 5x - 5$

$\boxed{2x^3 - 7x^2 + 7x - 5}$

(49) $\sqrt{x}(x - \sqrt{x}) = x\sqrt{x} - x$

(50) $x^{\frac{3}{2}}\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right) = x^{\frac{3}{2}}\left(x^{\frac{1}{2}} - x^{-\frac{1}{2}}\right)$

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

$= x^2 - x$

(51) $y^{\frac{1}{3}}\left(y^{\frac{2}{3}} + y^{\frac{5}{3}}\right) = y^{\frac{3}{3}} + y^{\frac{6}{3}}$

$= y + y^2$

$= \boxed{y^2 + y}$

(52) $x^{\frac{1}{4}}\left(2x^{\frac{3}{4}} - x^{\frac{1}{4}}\right)$

$= 2x^{\frac{4}{4}} - x^0$

$= 2x - 1$

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

$= \boxed{x^4 - a^4}$

(54) $(x^{\frac{1}{2}} + y^{\frac{1}{2}})(x^{\frac{1}{2}} - y^{\frac{1}{2}})$

$= \boxed{x - y}$

(55) $(\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})$

$= \boxed{a - b}$

(56) $(\sqrt{h^2+1} + 1)(\sqrt{h^2+1} - 1)$

$= ((h^2+1) - 1)$

$= \boxed{h^2}$

(57) $((x-1) + x^2)((x-1) - x^2)$

$= (x-1)^2 - x^4$

$= \boxed{x^2 - x^2 - 2x + 1}$

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

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

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

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

(59) $(2x + y - 3)(2x + y + 3)$

$= (2x+y)^2 - 9$

$= \boxed{4x^2 + 4xy + y^2 - 9}$

(60) $(x + y + z)(x - y - z)$

$= [x + (y+z)][x - (y+z)]$

$= x^2 - (y+z)^2$

$= x^2 - [y^2 + 2yz + z^2]$

$= x^2 - y^2 - 2yz + z^2$

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(61) $-2x^3 + 16x$

$= \boxed{-2x(x^2 - 8)}$ or $2x(-x + 8)$

(62) $2x^4 + 4x^3 - 14x^2$

$= \boxed{2x^2(x^2 + 2x - 7)}$ or $-2x^2(-x^2 - 2x + 7)$

(63) $y(y-6) + 9(y-6)$

$= \boxed{(y-6)(y+9)}$

(64) $(z+2)^2 - 5(z+2)$

$= (z+2)(z+2-5)$

$= (z+2)(z-3)$

(65) $2x^2y - 6xy^2 + 3xy$

$= \boxed{xy(2x - 6y + 3)}$

(66) $-7x^4y^2 + 14xy^3 + 21xy^4$

$= -7xy^2(x^3 - 2y - 3y^2)$

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

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

(68) $x^2 - 6x + 5$

$= \boxed{(x-5)(x-1)}$

(69) $8x^2 - 14x - 15$

$\boxed{(2x-5)(4x+3)}$

(70) $6y^2 + 11y - 21$

$= \boxed{(6y - 7)(y + 3)}$

(71) $3x^2 - 16x + 5$

$= \boxed{(3x-1)(x-5)}$

(72) $5x^2 - 7x - 6$

$\boxed{(5x + 3)(x - 2)}$

(73) $(3x+2)^2 + 8(3x+2) + 12$

$= [(3x+2) + 6][(3x+2) + 2]$

$= \boxed{(3x+8)(3x+4)}$

(74) $2(a+b)^2 + 5(a+b) - 3$

$= [2(a+b) - 1][(a+b) + 3]$

$= \boxed{(2a+b-1)(a+b+3)}$

(75) $9a^2 - 16$

$= \boxed{(3a-4)(3a+4)}$

(76) $(x+3)^2 - 4$

$= [(x+3) - 2][(x+3) + 2]$

$= \boxed{(x+5)(x-1)}$

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(77) $27x^3 + y^3$

$= (3x+y)(9x^2 - 3xy + y^2)$

(78) $a^3 - b^6$

$= (a-b^2)(a^2 + ab^2 + b^4)$

(79) $8s^3 - 125t^3$

$= (2s-5t)(4s^2 + 10st + 25t^2)$

(80) $1 + 1000y^3$

$= (1+10y)(1 - 10y + 100y^2)$

(81) $x^2 + 12x + 36$

$= (x+6)^2$

(82) $16z^2 - 24z + 9$

$= (4z-3)^2$

(83) $x^3 + 4x^2 + x + 4$

$x^2(x+4) + 1(x+4)$

$= (x+4)(x^2+1)$

(84) $3x^3 - x^2 + 6x - 2$

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

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

(85) $2x^3 + x^2 - 6x - 3$

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

$= (2x+1)(x^2-3)$ or

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

(86) $-9x^3 - 3x^2 + 3x + 1$

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

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

$= -(3x+1)(3x^2-1)$ or

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

(87) $x^3 + x^2 + x + 1$

$x^2(x+1) + 1(x+1)$

$= (x+1)(x^2+1)$ or

(88) $x^5 + x^4 + x + 1$

$x^4(x+1) + 1(x+1)$

$= (x+1)(x^4+1)$

(89) $x^{\frac{5}{2}} - x^{\frac{1}{2}}$

$= x^{\frac{1}{2}}\left(x^{\frac{4}{2}} - 1\right)$

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

$= \sqrt{x}\,(x-1)(x+1)$

(90) $3x^{-\frac{1}{2}} + 4x^{\frac{1}{2}} + x^{\frac{3}{2}}$

$= x^{-\frac{1}{2}}\left(3 + 4x + x^2\right)$

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

$= \dfrac{(x+1)(x+3)}{\sqrt{x}}$

$= \dfrac{1}{\sqrt{x}}(x+1)(x+3)$

(91)

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

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

$= \frac{1}{x^{\frac{3}{2}}}\left(1 + x\right)^2$ or

$= \frac{1}{\sqrt{x^3}}(x+1)^2$ or

$= \frac{(x+1)^2}{\sqrt{x^3}}$ or $\frac{(x+1)^2}{x\sqrt{x}}$

(92) $(x-1)^{\frac{7}{2}} - (x-1)^{\frac{3}{2}}$

$= (x-1)^{\frac{3}{2}}\left[(x-1)^2 - 1\right]$

$= (x-1)^{\frac{3}{2}}\left[(x-1) - 1\right]\left[(x-1) + 1\right]$

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

(93) $(x^2+1)^{\frac{1}{2}} + 2(x^2+1)^{-\frac{1}{2}}$

$= (x^2+1)^{-\frac{1}{2}}\left[(x^2+1) + 2\right]$

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

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

(94) $x^{-\frac{1}{2}}(x+1)^{\frac{1}{2}} + x^{\frac{1}{2}}(x+1)^{-\frac{1}{2}}$

$= x^{-\frac{1}{2}}(x+1)^{-\frac{1}{2}}\left[(x+1) + x\right]$

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

$= \left(\frac{1}{\sqrt{x}}\right)\left(\frac{1}{\sqrt{(x+1)}}\right)(2x+1)$

(95) $12x^3 + 18x$

$= 6x(2x^2+3)$

(96) $30x^3 + 15x^4$

$= 15x^3(2+x)$

(97) $x^2 - 2x - 8$

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

(98) $x^2 - 14x + 48$

$(x-8)(x-6)$

(99) $2x^2 + 5x + 3$

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

(100) $2x^2 + 7x - 4$

$= (2x-1)(x+4)$

(101) $9x^2 - 36x - 45$

$= 9(x^2 - 4x - 5)$

$= 9(x-5)(x+1)$

(102) $8x^2 + 10x + 3$

$(2x+1)(4x+3)$

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(103) $49 - 4y^2$

$= (7-2y)(7+2y)$

(104) $4t^2 - 9s^2$

$= (2t-3s)(2t+3s)$

(105) $t^2 - 6t + 9$

$= (t-3)^2$

(106) $x^2 + 10x + 25$

$= (x+5)^2$

(107) $4x^2 + 4xy + y^2$

$(2x+y)^2$

(108) $r^2 - 6rs + 9s^2$

$= (r-3s)^2$

(109) $(a+b)^2 - (a-b)^2$

$= [(a+b) - (a-b)][(a+b) + (a-b)]$

$= [2b][2a]$

$= 4ab$

(110) $\left(1+\frac{1}{x}\right)^2 - \left(1-\frac{1}{x}\right)^2$

$= \left[\left(1+\frac{1}{x}\right) - \left(1-\frac{1}{x}\right)\right]\left[\left(1+\frac{1}{x}\right) + \left(1-\frac{1}{x}\right)\right]$

$= \left[\frac{2}{x}\right][2]$

$= \frac{4}{x}$ or $4\left(\frac{1}{x}\right)$

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(111) $x^2(x^2-1) - 9(x^2-1)$
$= (x^2-1)(x^2-9)$
$= (x-1)(x+1)(x-3)(x+3)$

(112) $(a^2-1)b^2 - 4(a^2-1)$
$= (a^2-1)(b^2-4)$
$= (a-1)(a+1)(b-2)(b+2)$

(113) $8x^3 - 125$
$= (2x-5)(4x^2+10x+25)$

(114) $x^6 + 64$
$= (x^2)^3 + (4)^3$
$= (x^2+4)(x^4-4x^2+16)$

(115) $x^3 + 2x^2 + x$
$= x(x^2+2x+1)$
$= x(x+1)^2$

(116) $3x^3 - 27x$
$= 3x(x^2-9)$
$= 3x(x-3)(x+3)$

(117) $x^4y^3 - x^2y^5$
$= x^2y^3(x^2-y^2)$
$= x^2y^3(x-y)(x+y)$

(118) $18y^3x^2 - 2xy^4$
$= 2xy^3(9x-y)$

(119) $2x^3 + 4x^2 + x + 2$
$= 2x^2(x+2) + 1(x+2)$
$= (x+2)(2x^2+1)$

(120) $3x^3 + 5x^2 - 6x - 10$
$= x^2(3x+5) - 2(3x+5)$
$= (3x+5)(x^2-2)$

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

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(122) $y^4(y+2)^3 + y^5(y+2)^4$

$= y^4(y+2)^3\left[1 + y(y+2)\right]$

$= y^4(y+2)^3\left[1+y^2+2y\right]$

$= y^4(y+2)^3\left[y^2+2y+1\right]$

$= y^4(y+2)^3(y+1)^2$

(123) $(a^2+1)^2 - 7(a^2+1) + 10$

$= \left[(a^2+1) - 2\right]\left[(a^2+1) - 5\right]$

$= \left[a^2-1\right]\left[a^2-4\right]$

$= (a-1)(a+1)(a-2)(a+2)$

(124) $(a^2+2a)^2 - 2(a^2+2a) - 3$

$= \left[(a^2+2a) + 1\right]\left[(a^2+2a) - 3\right]$

$= \left[a^2+2a+1\right]\left[a^2+2a-3\right]$

$= (a+1)^2(a-1)(a+3)$

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(125) $5(x^2+4)^4(2x)(x-2)^4 + (x^2+4)^5(4)(x-2)^3$

$= (x^2+4)^4(2)(x-2)^3\left[5x(x-2) + (x^2+4)(2)\right]$

$= 2(x^2+4)^4(x-2)^3(5x^2-10x+2x^2+8)$

$= \boxed{2(x^2+4)^4(x-2)^3(7x^2-10x+8)}$

(126) $3(2x-1)^2(2)(x+3)^{\frac{1}{2}} + (2x-1)^3\left(\frac{1}{2}\right)(x+3)^{-\frac{1}{2}}$

$= \frac{1}{2}(2x-1)^2(x+3)^{-\frac{1}{2}}\left[12(2x-1)(x+3) + 1\right]$

$= \frac{1}{2}(2x-1)^2(x+3)^{-\frac{1}{2}}(12(2x^2+6x-x-3)+1)$

$= \frac{1}{2}(2x-1)^2(x+3)^{-\frac{1}{2}}(24x^2+60x-35)$

(126) $3(2x-1)^2(2)(x+3)^{\frac{1}{2}} + (2x-1)^3\left(\frac{1}{2}\right)(x+3)^{-\frac{1}{2}}$

$= \frac{1}{2}(2x-1)^2(x+3)^{-\frac{1}{2}}\left[(3)(4)(x+3) + (2x-1)\right]$

$= \frac{1}{2}(2x-1)^2(x+3)^{-\frac{1}{2}}\left[12(x+3) + 2x-1\right]$

$= \frac{(2x-1)^2}{2(x+3)^{\frac{1}{2}}}\left[12x+36+2x-1\right]$

$= \frac{(2x-1)^2}{2\sqrt{(x+3)}}(14x+35)$

$= \boxed{\frac{(2x-1)^2(14x+35)}{2\sqrt{x+3}}}$

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

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

$= (x^2+3)^{-\frac{4}{3}}\left(\frac{1}{3}x^2+3\right)$

$= (x^2+3)^{-\frac{4}{3}}\left(\frac{1}{3}\right)(x^2+1)$

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

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

$= \frac{1}{2}x^{-\frac{1}{2}}(3x+4)^{-\frac{1}{2}}\left[(3x+4) - 3x\right]$

$= \frac{1}{2}\left(x^{-\frac{1}{2}}\right)(3x+4)^{-\frac{1}{2}}(4)$

$= 2\left(x^{-\frac{1}{2}}\right)(3x+4)^{-\frac{1}{2}}$

or

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