Worksheet 5-2

(1) 3 terms

-4	b^3
2	b^2
-3	b

(2) 4 terms (2 can be combined)

9	x^3
3	x^3
-4	x
2	

(3) 2 terms

$-\frac{2}{3}$	y^2
$4/3$	y

(4) $7z^3 - 4z^3 + 5z^3 - 11z^3$

$= 3z^3 + 5z^3 - 11z^3$

$= 8z^3 - 11z^3$

$= \boxed{-3z^3}$

(5) $4y^4 - 7y^2 + 4 - 7y^3 + 9y^4 - 2y^2 - 3y$

$= 4y^4 + 9y^4 - 7y^3 - 7y^2 - 2y^2 - 3y + 4$

$= \boxed{13y^4 - 7y^3 - 9y^2 - 3y + 4}$

(6) ~~$-\frac{1}{4}r^3 + 0r$~~

$-\frac{1}{2}r^3 + \frac{1}{4}r^3 + \frac{1}{3}r - \frac{1}{3}r$

$= \boxed{-\frac{1}{4}r^3 + 0}$

(7) a, b

(8) c

(9) $x = 3$

$-(3)^2 + 5(3) - 9$

$= -9 + 15 - 9$

$= -18 + 15$

$= \boxed{-3}$

(10) $2(3)^3 + 4(3)^2 - 7(3) + 3$

~~$2 \cdot 3 + 4 \cdot 3$~~

$= 2 \cdot 27 + 4 \cdot 9 - 21 + 3$

$= 54 + 36 - 18$

$= \boxed{72}$

(11)

$$\begin{array}{r} 5m^4 + 2m^3 - 4 \\ + \; -3m^4 + 5m^3 - 3 \\ \hline 2m^4 + 7m^3 - 7 \end{array}$$

(12)

$$\begin{array}{r} 3x^2 + 2x^4 - 3 \\ + \; 8x^3 - 5x^4 - 6x^2 \end{array}$$

Rearrange terms so like terms are aligned

$$\begin{array}{r} 2x^4 + 0x^3 + 3x^2 - 3 \\ + \; -5x^4 + 8x^3 - 6x^2 + 0 \\ \hline -3x^4 + 8x^3 - 3x^2 - 3 \end{array}$$

(13)

$$\begin{array}{r} 6m^3 - 5m \\ - \; (7m^3 - 3m) \end{array}$$

→ change signs

$$\begin{array}{r} 6m^3 - 5m \\ + \; -7m^3 + 3m \\ \hline -m^3 - 2m \end{array}$$

(14) $2x^3 - 4x^2 + 3x + 10$

$+ (-1)(6x^3 - 4x + 2)$

$= 2x^3 - 4x^2 + 3x + 10 - 6x^3 + 4x - 2$

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

(15) $7z(5z^2 + 2)$

$= (7z)(5z^2) + (7z)(2)$

$= \boxed{35z^3 + 14z}$

(16) $-3y^2(2y^3 + 3y^2 - 4y + 11)$

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

$+ (-3y^2)(-4y) + (-3y^2)(11)$

$= \boxed{-6y^5 - 9y^4 + 12y^3 - 33y^2}$

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(17) $-3r^2s^3(8r^2s^2 - 4rs + 2rs^2)$

$= (-3r^2s^3)(8r^2s^2) + (-3r^2s^3)(-4rs) + (-3r^2s^3)(2rs^2)$

$= (-3\cdot 8)r^2\cdot r^2\cdot s^3\cdot s^2 + (-3)(-4)r^2 r s^3 s + (-3)(2)r^2 r s^3 s^2$

$= \boxed{-24r^4s^5 + 12r^3s^4 + (-6)r^3s^5}$

(18) $(x+3)(x+9)$

$= x^2 + 3x + 9x + 27$

$= \boxed{x^2 + 12x + 27}$

(19) $(y+4)(y^2 - 4y + 16)$

$= (y+4)y^2 + (y+4)(-4y) + (y+4)(16)$

$= y^3 + 4y^2 - 4y^2 - 16y + 16y + 64$

$= \boxed{y^3 + 64}$

(20) $(2x+3)(2x^2 - 3x + 2)$

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

$= 4x^3 + 6x^2 - 6x^2 - 9x + 4x + 6$

$= \boxed{4x^3 - 5x + 6}$

(21) $(2x^2 + 3x + 2)(4x^3 + 2x + 3)$

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

$= 8x^5 + 12x^4 + 8x^3 + 4x^3 + 6x^2 + 4x + 6x^2 + 9x + 6$

$= \boxed{8x^5 + 12x^4 + 12x^3 + 12x^2 + 13x + 6}$

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(22) $(4m+3)(m-7)$

$= (4m)(m) + 3m - 28m - 21$

$= \boxed{4m^2 - 25m - 21}$

(23) $(2v^2 + w^2)(v^2 - 3w^2)$

$= (2v^2)(v^2) + (2v^2)(-3w^2) + (w^2)(v^2) + (w^2)(-3w^2)$

$= 2v^4 - 6v^2w^2 + w^2v^2 - 3w^4$

$= \boxed{2v^4 - 5v^2w^2 - 3w^4}$

(24) $(a+2b)^2 = (a+2b)(a+2b)$

$= \boxed{a^2 + 4ab + 4b^2}$

(25) $(2m+5)^2 = (2m)^2 + 2(2m)(5) + (5)^2$

$= \boxed{4m^2 + 20m + 25}$

(26) $(2m-3p)^2 = (2m)^2 + 2(2m)(-3p) + (3p)^2$

$= \boxed{4m^2 - 12mp + 9p^2}$

(27) $(12-x)(12+x) = \boxed{144 - x^2}$

(28) $(7x-3y)(7x+3y) = \boxed{49x^2 - 9y^2}$

(29) $(y^2+2)(y^2-2) = (y^2)^2 - (2)^2$

$= \boxed{y^4 - 4}$

(30) $(2x-3)^3$

$= (2x-3)\cdot(2x-3)^2$

$= (2x-3)(4x^2 - 12x + 9)$

$= (2x-3)(4x^2) + (2x-3)(-12) + (2x-3)(9)$

$= 8x^3 - 12x^2 + (-24)x + 36 + 18x - 27 = \boxed{8x^3 - 12x^2 - 6x - 9}$

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(31) $$\frac{12m^4 - 9m^3 + 6m^2}{3m^3}$$

$$= \frac{12m^4}{3m^3} - \frac{9m^3}{3m^3} + \frac{6m^2}{3m^3} = \boxed{4m - 3 + \frac{2}{m}}$$

(32) $$\frac{-54m^3 + 30}{3m^3} = \frac{-54m^3}{3m^3} + \frac{30}{3m^3} = \boxed{-18 + \frac{10}{m^3}}$$

(33) $$\frac{12x^6 + 18x^5 + 30x^3}{6x^2} = \frac{12x^6}{6x^2} + \frac{18x^5}{6x^2} + \frac{30x^3}{6x^2} = \boxed{2x^4 + 3x^3 + 5x}$$

(34) $$\frac{m^2 + 3m - 12}{m} = \frac{m^2}{m} + \frac{3m}{m} - \frac{12}{m} = \boxed{m + 3 - \frac{12}{m}}$$

(35) $$\frac{18a^2 - 9a - 5}{3a + 1} \rightarrow$$

$$\begin{array}{r} 6a - 5 \\ 3a+1 \;\overline{)\; 18a^2 - 9a - 5} \\ -(18a^2 + 6a) \\ \hline -15a - 5 \\ (-15a - 5) \\ \hline 0 \end{array}$$

$\rightarrow \boxed{6a - 5}$

(36) $$\frac{2z^3 - 7z^2 + 3z + 2}{2z + 3} \rightarrow$$

$$\begin{array}{r} z^2 - 5z + 9 \quad -\frac{25}{2z+3} \\ 2z+3 \;\overline{)\; 2z^3 - 7z^2 + 3z + 2} \\ -(2z^3 + 3z^2) \\ \hline -10z^2 + 3z \\ -(-10z^2 - 15z) \\ \hline 0 + 18z + 2 \\ -(18z + 27) \\ \hline -25 \end{array}$$

$$\boxed{z^2 - 5z + 9 - \frac{25}{2z+3}}$$