KEY

5.1 & 5.2 Review & Practice - In-class Assignment

1. $c^{12} \cdot c^{-4} \cdot c^{6}$

$c^{12-4+6} = \boxed{c^{14}}$

2. $\frac{8m^3n^2}{4mn^3} = 2m^{3}m^{-1}n^{2}n^{-3} = 2mn^{2-1}$

$= \boxed{\frac{2m^2}{n}}$

3. $(a^4)^5 = \boxed{a^{20}}$

4. $\frac{x^{-2}y}{x^4y^{-1}} = x^{-2}x^{-4}yy^{1}$

$= x^{-6}y^{2} = \boxed{\frac{y^2}{x^6}}$

5. $\left(\frac{a^2b}{a^{-3}b^2}\right)^{-1} = \left(\frac{a^{-3}b^2}{a^2b}\right)^{1}$

$= a^{-3}a^{-2}b^{2}b^{-1}$

$= a^{-5}b^{1} = \boxed{\frac{b}{a^5}}$

6. $\left(\frac{x^2y}{xy^3}\right)^2 = \frac{x^4y^2}{x^2y^6} = x^{4}x^{-2}y^{2}y^{-6} = x^{2}y^{-4}$

$= \boxed{\frac{x^2}{y^4}}$

7. $(-5a^2b^3)^2(abc)^2$

$(25a^4b^6)(a^2b^2c^2)$

$\boxed{25a^6b^8c^2}$

8. $\frac{2^3c^{-4}t^2}{2^{-2}c^4t^5} = 2^{3}2^{2}c^{-4}c^{-4}t^{2}t^{-5}$

$= 2^5c^{-8}t^{-3} = \boxed{\frac{32}{c^8t^3}}$

9. $4j(-j^{-2}k^2)(3j^3k^{-7})$

$\boxed{\frac{-12j^2}{k^5}}$

10. $\frac{2mn^2(3m^2n)^2}{12m^3n^4} = \frac{2mn^2(9m^4n^2)}{12m^3n^4} = \frac{18m^5n^4}{12m^3n^4}$

$= \frac{3m^5m^{-3}n^4n^{-4}}{2} = \boxed{\frac{3m^2}{2}}$

Exercises:

Simplify using long division.

1. $\frac{4xy^2-2xy-2x^2y}{xy}$

$\frac{4xy^2}{xy} - \frac{2xy}{xy} - \frac{2x^2y}{xy}$

$\boxed{4y - 2 - 2x}$

2. $\frac{(3a^2b-6ab+5ab^2)(ab)^{-1}}{ab}$

$\frac{3a^2b}{ab} - \frac{6ab}{ab} + \frac{5ab^2}{ab}$

$\boxed{3a - 6 + 5b}$

3. $(x^4 - 3x^3 + 2x^2 - 4x + 4) \div (x - 1)$

1	1	-3	2	-4	4
	↓	1	-2	0	-4
	1	-2	0	-4	0

$x^3 - 2x^2 - 4$

4. $\frac{x^3+3x^2-5x-4}{x+4}$

-4	1	3	-5	-4
	↓	-4	4	4
	1	-1	-1	0

$x^2 - x - 1$

5. $(x^4 - 3x^2 - 18) \div (x - 2)$

2	1	0	-3	0	-18
	↓	2	4	2	4
	1	2	1	2	-14

$x^3 + 2x^2 + x + 2 \; \frac{-14}{x-2}$

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

$2x^2 + 5 + \frac{21}{3x^2-6}$

$3x^2+0x-6 \;\overline{)\; 6x^4+0x^3+3x^2+0x-9}$

$-6x^4+0x^3+12x^2$ ↓ ↓

$15x^2+0x-9$

$-15x^2+0x+30$

21

Simplify using synthetic division.

7. $(4x^2 + 5x + 1) \div (x + 1)$

-1	4	5	1
	↓	-4	-1
	4	1	0

$4x + 1$

8. $(x^4 - 3x^3 - 7x - 14) \div (x - 4)$

4	1	-3	0	-7	-14
	↓	4	4	16	36
	1	1	4	9	22

$x^3 + x^2 + 4x + 9 + \frac{22}{x-4}$

9. $(x^4 + 6x^3 + 6x^2) \div (x + 5)$

-5	1	6	6	0	0
	↓	-5	-5	-5	25
	1	1	1	-5	25

$x^3 + x^2 + x - 5 + \frac{25}{x+5}$

10. $(4x^4 + 2x^3 + 3x + 5) \div (2x + 1)$

$2x^3 + \frac{3}{2} + \frac{7/2}{2x+1}$

$2x+1 \;\overline{)\; 4x^4+2x^3+0x^2+3x+5}$

$-4x^4+2x^3$ ↓

$0x^2$ ↓ ↓

$-3x+5$

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

$\frac{7}{2}$

or $2x^3 + 1.5 + \frac{3.5}{2x+1}$