

LESSON PLAN

Course: Grade 12 U Advanced Functions

Lesson : 1 - 4

Unit/Chapter: Polynomial Skills

Topic: Long Division

- ❑ **homework check:** FM12 p. 21 exercise 1.6 # 2 – 6 odds
FM11 exercise 2.8 # 3 & 5 LHC

- ❑ **note:** Long Division

The method of long division of whole numbers and decimals can be used to divide polynomials. Recall:

$$\begin{array}{r} 441 \\ 22 \overline{)9704} \\ \underline{88} \\ 90 \\ \underline{88} \\ 24 \\ \underline{22} \\ 2R \end{array}$$

To divide polynomials, we use this same method, paying particular attention to the “x” term when we divide and “tagging” the numerical coefficient along as we multiply and subtract. When dividing, rewrite all polynomials in descending order. If a power of “x” is missing, it should be written in with a coefficient of zero. For example,

$$\begin{array}{r} 4x - 3 \\ 3x + 2 \overline{)12x^2 - x - 3} \\ \underline{-(12x^2 + 8x)} \\ -9x - 3 \\ \underline{-(-9x - 6)} \\ 3R \end{array}$$

- ❑ **homework assignment:** FM12 p. 23 exercise 1.7

EXERCISE 1.7

B 1. Divide and state any restrictions on the variables.

- (a) $(x^3 - 2x^2 + 2x - 15) \div (x - 3)$
 (b) $(x^3 + 3x^2 - 9x - 20) \div (x + 4)$
 (c) $(x^3 + 2x^2 - 5x - 7) \div (x + 3)$
 (d) $(5w^2 - 4w - 2 + w^3) \div (w - 1)$
 (e) $(11x^2 - 22 + 26x + x^3) \div (6 + x)$
 (f) $(3t - 6 - 2t^2 + t^3) \div (t - 2)$
 (g) $(24 + 6x - 7x^2 + x^3) \div (x - 5)$
 (h) $(5x^2 + x^3 - 4x - 20) \div (5 + x)$
 (i) $(x^4 + 4x^3 + 2x^2 - 3x + 2) \div (x + 2)$
 (j) $(2w - 4w^2 + 2w^4 - 5w^3 + 3) \div (w - 3)$

2. Divide and state any restrictions on the variables.

- (a) $(2x^3 + x^2 + x - 1) \div (2x - 1)$
 (b) $(21w - 11w^2 + 3w^3 - 7) \div (3w - 2)$

- (c) $(2 + 5t - t^2 + 6t^3) \div (1 + 3t)$
 (d) $(6z^3 + 13z^2 - 9) \div (2z + 3)$
 (e) $(9x^2 - 8 + 4x^3) \div (2 + x)$
 (f) $(4x^3 + 5x + 21) \div (2x + 3)$
 (g) $(2w - 1 + 9w^3) \div (3w - 2)$
 (h) $(10 + 9x + x^3) \div (2 + x)$

C 3. Divide. No divisors are zero.

- (a) $(x^4 + x^3 - 13x^2 - 25x - 12) \div (x^2 + 2x + 1)$
 (b) $(2w^3 - 4 - 8w - 3w^2 + w^4) \div (w^2 - w - 2)$
 (c) $(t^4 - 17t^2 - 36t - 20) \div (t^2 - 3t - 4)$
 (d) $(x^3 + x^2y - xy^2 - y^3) \div (x - y)$
 (e) $(x^4 - 2x^3y + 2x^2y^2 - 2xy^3 + y^4) \div (x^2 + y^2)$
 (f) $(x^3 - 4x^2y + 5xy^2 - 2y^3) \div (x - 2y)$

EXERCISE 1.7

- (a) $x^2 + x + 5, x \neq 3$
 (c) $x^2 - x - 2, R -1, x \neq -3$
 (e) $x^2 + 5x - 4, R 2, x \neq -6$
 (g) $x^2 - 2x - 4, R 4, x \neq 5$
 (i) $x^3 + 2x^2 - 2x + 1, x \neq -2$

2. (a) $x^2 + x + 1, x \neq \frac{1}{2}$
 (c) $2t^2 - t + 2, t \neq -\frac{1}{3}$
 (e) $4x^2 + x - 2, R -4, x \neq -2$
 (g) $3w^2 + 2w + 2, R 3, w \neq \frac{2}{3}$

3. (a) $x^2 - x - 12$
 (d) $(x + y)^2$

- (b) $w^2 + 3w + 2$
 (e) $(x - y)^2$

- (b) $x^2 - x - 5, x \neq -4$
 (d) $w^2 + 6w + 2, w \neq 1$
 (f) $t^2 + 3, t \neq 2$
 (h) $x^2 - 4, x \neq -5$
 (j) $2w^3 + w^2 - w - 1, w \neq 3$
 (b) $w^2 - 3w + 5, R 3, w \neq \frac{2}{3}$
 (d) $3z^2 + 2z - 3, z \neq -\frac{3}{2}$
 (f) $2x^2 - 3x + 7, x \neq -\frac{3}{2}$
 (h) $x^2 - 2x + 13, R -16, x \neq -2$

- (c) $t^2 + 3t + 2$
 (f) $(x - y)^2$