

Advanced Precalculus
Synthetic Division

Name: _____

I. In Problems 1-8, do the following:

- 1 Perform Synthetic Division and write as Polynomial = Divisor * Quotient + Remainder
- 2 Expand to check your answer.

1.)
$$\frac{x^3 - 3x^2 + 8x - 20}{x - 4}$$

2.)
$$\frac{x^5 + 3x^3 - 5x^2 - 12}{x - 3}$$

3.)
$$\frac{5x^7 - 4x^3 + 2x^2 - 1}{x + 1}$$

4.)
$$\frac{x^9 + 8x^7 - 5x^4 + 2x^2 - 1}{x - 1}$$

5.)
$$\frac{x^9 - 1}{x + 1}$$

6.)
$$\frac{8x^{10} - 7x^5 + 4x^2 - 2}{x - 1}$$

7.)
$$\frac{3x^4 - 5x^3 - 6x^2 + 13x - 1}{3x - 5}$$

8.)
$$\frac{3x^3 - 7x^2 - 13x}{x - 4}$$

II. In Problems 9 – 15, do the following:

Given factors of each polynomial, factor the polynomial completely.

9.) $x^4 - 11x^2 + 18x - 8$; Factors = $(x - 2)$; $(x - 1)$

10.) $6x^4 + 23x^3 - 16x^2 - 53x - 20$; Factors = $(2x + 1)$; $(x + 1)$

11.) $10x^4 - 63x^3 + 2x^2 + 93x + 18$; Factors = $(2x - 3)$; $(x - 6)$

12.) $6x^4 - 17x^3 - 64x^2 - 7x + 10$; Factors = $(x + 2)$; $(x - 5)$

13.) $x^4 + 2x^3 - 13x^2 - 14x + 24$; Factors = $(x + 1)$; $(x + 4)$

14.) $36x^4 - 36x^3 - 31x^2 + 14x + 8$; Factors = $(2x + 1)^2$

15.) $6x^4 + 11x^3 - 48x^2 + 19x + 12$; Factors = $(3x + 1)$; $(2x - 3)$