

**Secondary Math III  
Polynomial Division  
Assignment 4.2**

**Carnegie Book: Pg. 239 #3(b)**

*Write the zero that corresponds to each factor.*

1.  $x + 5$       2.  $x - 12$       3.  $2x + 1$

Name: \_\_\_\_\_

Period: \_\_\_\_\_

*Write the factor that corresponds to each zero.*

4.  $x = -7$       5.  $x = 2$       6.  $x = -\frac{3}{8}$

7. The given table of values represents the function

$$f(x) = x^3 + 9x^2 + 14x - 24.$$

$x$	-2	-1	0	1	2
$f(x)$	-24	-30	-24	0	48

a) Determine one of the factors of  $f(x)$  without using a calculator. Explain your reasoning.

b) Completely factor  $f(x)$  without using a calculator.

c) Determine all the zeros of  $f(x)$  without using a calculator.

*Use Synthetic Division to determine each quotient (and remainder – if necessary). Complete work must be shown for credit! Write the quotient +R/divisor. Determine if each divisor is a factor of the polynomial.*

8.  $(x^4 + 8x^3 - 3x^2 - 24) \div (x - 3)$

Quotient: \_\_\_\_\_

9.  $\frac{x^4 - 3x^3 + 6x^2 - 12x + 8}{x - 1}$

Quotient: \_\_\_\_\_

10.  $\frac{x^3 + x^2 - 16x - 16}{x + 2}$

Quotient: \_\_\_\_\_

11.  $(x^4 + 6x^3 - 12x^2 - 38x - 21) \div (x - 1)$

Quotient: \_\_\_\_\_

12.  $(2x^3 + 21x^2 + 22x - 45) \div (2x + 5)$

Quotient: \_\_\_\_\_

13.  $\frac{3x^5 + 20x^4 + 9x^3 - 92x^2 - 60x}{3x + 2}$

Quotient: \_\_\_\_\_

Use synthetic division to determine the following.

14.  $p(1)$  if  $p(x) = x^4 + 3x^3 - 6x^2 - 8x$

15.  $p(-3)$  if  $p(x) = 2x^4 + 5x^3 + 8x^2 + 15x + 6$

check:

check:

16. If  $f(x) \div (x-3) = x^2 - 7x - 13 + \frac{25}{x-3}$ , find the following:

a.  $q(x) =$

b.  $R =$

c.  $f(3) =$

d. Multiply  $q(x)$  by the divisor and add the remainder to find  $f(x)$ .

e. Use  $f(x)$  to find  $f(8)$ .

f. Is  $(x - 8)$  a factor of  $f(x)$ ?

17. The function  $m(x) = 2x^2 + 6x - 7$  has the same remainder when divided by  $(x - a)$  and when divided by  $(x - 2a)$ , where  $a \neq 0$ . Find  $a$ .