

Advanced Algebra

Polynomial Functions: The Remainder & Factor Theorems - Homework

Divide each of the following using synthetic division:

1) $(3x^3 - 17x^2 + 15x - 25) \div (x - 5)$

2) $(2x^4 - 7x^2 + 5x + 8) \div (x + 4)$

3) $(x^5 - 13x^4 - 120x + 80) \div (x + 3)$

Evaluate each of the following functions at the given value of x :

4) $f(x) = 3x^3 - 17x^2 + 15x - 25$, find $f(5)$

5) $f(x) = 2x^4 - 7x^2 + 5x + 8$, find $f(-4)$

6) $f(x) = x^5 - 13x^4 - 120x + 80$, find $f(-3)$

7) Compare the results of #1-3 and #4-6 and make a conjecture.

8) In #1, the remainder was zero. In #4, the value was zero. What implications does this have?

10) What does the term, *factor of a polynomial*, mean?

11) Find the value of the constant, c , such that the denominator will be a *factor* of the numerator.

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