Answer on Question #42690 – Math - Calculus

Divide using synthetic division, and write a summary statement in fraction form.

2x^5-x^4+3x^2-x+5 / x-1

show work please

Solution:
To convert the polynomial division into the required "mixed number" format, I have to do the division; I will show most of the steps.

First, write down all the coefficients, and put the zero from $x - 1 = 0$ (so $x = 1$) at the left.

Next, carry down the leading coefficient:

Multiply by the potential zero, carry up to the next column, and add down:

Repeat this process:

Putting this result into the required "mixed number" format, I get the answer as being:

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

It is always true that, when you use synthetic division, your answer (in the bottom row) will be of degree one less than what you'd started with, because you have divided out a linear factor. That was how I knew that my answer, denoted by the "2 1 1 4 3 8" in the bottom row, stood for a x^5, since I had started with a quadratic.

Answer: $2x^4 + x^3 + x^2 + 4x + 3 + \frac{8}{x-1}$.