

October 16, 2017

3.3 #31) $\frac{x^3 - 8x + 2}{x+3}$

ⓐ Long Division

	x^3	$+0x^2$	$-8x$	$+2x^0$
$x+3$	$\overline{) x^3}$	$+3x^2$	$-8x$	$+2$
	$-x^3$	$-3x^2$	$+8x$	-2
	0	$-3x^2$	$+8x$	-2
		$+3x^2$	$-8x$	$+2$
		$-3x^2$	$+8x$	-2
		0	$+x$	$+2$
			$-x$	-3
			0	-1

ans: $x^2 - 3x + 1 - \frac{1}{x+3}$

$(x+3)(x^2 - 3x + 1) - 1$

$\frac{x^3 - 3x^2 + x + 3x^2 - 9x + 3 - 1}{x+3}$

$\frac{x^3 - 8x + 2}{x+3}$ ✓

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ⓑ Synthetic (by a linear divisor)

$\frac{x^3 - 8x + 2}{x+3}$ ← Linear

-3 | 1 0 -8 2

 | 0 -3 9 -3

 | -3 1 -1

 | 1 -3 1 -1

$1 \cdot x^2 - 3x^1 + 1x^0 - 1$

ans: $x^2 - 3x + 1 - \frac{1}{x+3}$

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

+3 | 2 -5 3

 | 6 -3

 | 2 1 6

$2 \cdot x^1 + 1 \cdot x^0 \frac{6}{x-3}$

ans: $2x + 1 - \frac{6}{x-3}$

$(x-3)(2x+1) + 6$

$\frac{2x^2 + x - 6x - 3 + 6}{x-3}$

$\frac{2x^2 - 5x + 3}{x-3}$ ✓

Oct 16-8:37 AM