University of Nottingham
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Foundation Algebra for Physical Sciences and Engineering (CELEN036)

Homework 5 Answers

1.

a. $x^3 - 5x^2 - 4x + 23 = (x-2)(x^2 - 3x - 10) + 3$

b. $2x^3 + 5x^2 + 4x + 17 = (x+3)(2x^2 - x + 7) - 4$

c. $x^3 - 8x^2 + 11x + 20 = (x-5)(x^2 - 3x - 4) + 0$

2.

a. $\dfrac{2x^2 - 5x - 3}{x-3} = (2x+1) + \dfrac{0}{x-3}$

b. $(x^3 - 3x^2 - 14x - 8) \div (x+2) = (x^2 - 3x - 10) + \dfrac{0}{x+2}$

c. $\dfrac{x^3 - 5x^2 - 4x + 23}{x-2} = (x^2 - 3x - 10) + \dfrac{3}{x-2}$

d. $(2x^3 - 5x^2 - 11x - 17) \div (x-4) = (2x^2 + 3x + 1) + \dfrac{-13}{x-4}$

3.

a. $x^3 + 5x^2 + 7 = (x+1)(x^2 + 4x - 4) + 11$

b. $x^3 - 13x^2 - 12 = (x-4)(x^2 - 9x - 12) - 156$

c. $3x^3 - 8x + 12 = (x-1)(3x^2 + 3x - 5) + 7$

d. $n^3 + 27 = (n+3)(n^2 - 3n + 9) + 0$

e. $x^4 + 3x^3 - 16x - 8 = (x-2)(x^3 + 5x^2 + 10x + 4) + 0$

4.

a.

	1	2	-5	-6
-3	↓	-3	3	6
	1	-1	-2	0

b.

	1	0	-7	6
2	↓	2	4	-6
	1	2	-3	0

c.

	9	18	-4	-8
$\frac{2}{3}$	↓	6	16	8
	9	24	12	0

5.

a. **i.** yes **ii.** yes

b. **i.** no **ii.** yes

c. **i.** yes **ii.** yes

6.

a. $p(x) = (x+3)(x-3)^2$

b. $p(x) = (x-2)^3$