

1.5 Answers

A-Level Pure Mathematics, Year 1 Additional Mathematics The Algebra of Polynomials

1.5.1 Solutions to 1.2 Exercise

Expression	Is the expression a polynomial ?	If the expression is not a polynomial, why not ?
$x^3 - x$	Yes	
$x^3 + 4.2x + 6.5$	Yes	
$x^2 + \sqrt{x}$	No	$\sqrt{x} = x^{0.5}$ which has a power that is not an integer
$(x + 4)(x - 5)$	Yes	
$x^4 + \sqrt{3}x^2 + \pi^2$	Yes	
$x^{10} + x^1 + x^{0.1}$	No	The power of $x^{0.1}$ is not an integer
$x + \frac{1}{x}$	No	$\frac{1}{x} = x^{-1}$ which has a power that is negative
$\sqrt{5}x^3 + x^{\sqrt{2}} - 41x + 20$	No	$x^{\sqrt{2}}$ has a power which is not an integer
$2\sin^2 x + 3\sin x + 12$	No	The only function allowed is "powers of x "

[18 marks]

1.5.2 Solutions to 1.4 Exercise

Polynomial Expression	What is the degree and name of the polynomial ?
$x^5 + 4x^3 + 576x^2 + 1$	5 : Quintic
$(2x + 7)(5x - 8)$	2 : Quadratic (whose graph is a Parabola)
$62 + 13x^4 - x^6$	6 : Sextic (or Hexic)
$(4 + x)(3x + 4)(1 - x)$	3 : Cubic
$(x^2 + 1)(x^2 - 1)$	4: Quartic
$x^3(3x - 4 + x^4)$	7 : Septic (or Heptic)
$3x - 5$	1: Linear (or Monic)

[7 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk