



Section 1.2 Polynomial functions, an introduction

input \rightarrow FUNCTION \rightarrow ^{ONE} OUTPUT
 (INPUT OUTPUT)
 (x, y)

PROJECT MATHS
 Text & Tests 6



Example 1

The length of a rectangle is $(2x + 3)$ cm. If the area of the rectangle is given by the polynomial function $A(x) = 2x^2 + 7x + 6$, find

- (a) an expression for the width of the rectangle
- (b) an expression for the perimeter, $P(x)$, of the rectangle
- ~~(c) the minimum value of x . (ignore)~~

<p>(i)</p> <p>$A = L \times W$</p> <p>$W = \frac{A}{L}$</p> <p>Factorise</p> <p>check $\begin{matrix} (2x)(2) = 4x \\ (3)(x) = 3x \\ \hline 7x \end{matrix}$</p> <p>$P = 2(L+W)$ (ii)</p>	<p>length $2x + 3$</p> <p>width</p> <p>Area $A(x) = 2x^2 + 7x + 6$</p> <p>$W = \frac{2x^2 + 7x + 6}{2x + 3}$</p> <p>$= \frac{(2x+3)(x+2)}{2x+3}$</p> <p>$W = x + 2$</p> <p>$P = 2(2x+3 + x+2)$</p> <p>$= 2(3x+5)$</p> <p>$P = 6x + 10$</p>
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Example 2

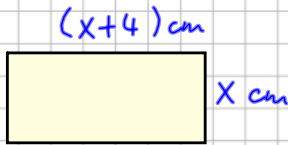
Given $f(x) = 3x^3 - 4x^2 - 3x + 4$ and $g(x) = 5x^3 + 14x^2 + 7x - 2$, find

- (a) $2f(x) - g(x)$ and state its degree
 (b) $f(x) + 2g(x)$ and state its degree.

	<p>(a) $2f(x) - g(x)$</p> $2(3x^3 - 4x^2 - 3x + 4) - (5x^3 + 14x^2 + 7x - 2)$ $6x^3 - 8x^2 - 6x + 8 - 5x^3 - 14x^2 - 7x + 2$ $x^3 - 22x^2 - 13x + 10$
Degree 3	

Exercise 1.2

1. A rectangle has one side 4 cm longer than the other.
 Let x be the length of the smaller side.
 Find (i) an expression for $A(x)$, the area of the rectangle
 (ii) an expression for $P(x)$, the perimeter of the rectangle.

	
(i)	$A = x(x+4) = x^2 + 4x$
(ii)	$P = 2(x+4 + x)$ $= 2(2x+4)$ $= 4x+8$

4. If $f(x) = 2x^3 - x^2 - 5x - 4$, find

(a) $f(0)$ (b) $f(1)$ (c) $f(-2)$ (d) $f(3a)$

x "input" = 0
output = ?

$$f(0) = 2(0)^3 - (0)^2 - 5(0) - 4$$

$$= -4$$

$$f(1) = 2(1)^3 - (1)^2 - 5(1) - 4$$

$$= 2 - 1 - 5 - 4$$

$$= -8$$

$$f(-2) = 2(-2)^3 - (-2)^2 - 5(-2) - 4$$

$$= -16 - 4 + 10 - 4$$

$$= -24 + 10$$

$$= -14$$

Careful
with signs!

$$f(3a) = 2(3a)^3 - (3a)^2 - 5(3a) - 4$$

$$= 54a^3 - 9a^2 - 15a - 4$$