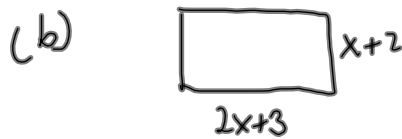**Example 1**   T&T6   ALGEBRA1   P.7

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 same rectangle
(c) the minimum value of x.

(a) $2x^2 + 7x + 6$
      $(2x + 3)(x + 2)$
      width $= x + 2$

(b)   [rectangle labeled $x+2$ on right side, $2x+3$ on bottom]

      $P = 2(x+2) + 2(2x+3)$
      $= 2x + 4 + 4x + 6$
      $= 6x + 10$

(c) $x + 2 > 0$ $2x + 3 > 0$
      $x > -2$ $2x > -3$
                           $x > -1.5$

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.

(a) $6x^3 - 8x^2 - 6x + 8 - 5x^3 - 14x^2 - 7x + 2$

     $= x^3 - 22x^2 - 13x + 10$ DEGREE $= 3$

(b) $3x^3 - 4x^2 - 3x + 4$
      $+ 10x^3 + 28x^2 + 14x - 4$
      $\overline{13x^3 + 24x^2 + 11x}$ DEGREE $= 3$

1

P. 9   Q 2 & 3   Homework

P. 10   Q 10 & 12   18-9-2012

2. The area of a rectangle, $A(x)$, is $6x^2 + 4x - 2$.
   If the length is given by $(3x - 1)$, find

   (i) an expression for the width of the rectangle

   (ii) an expression for the perimeter, $P(x)$, of the rectangle.

(i) $6x^2 + 4x - 2$

   $(3x - 1)(2x + 2)$
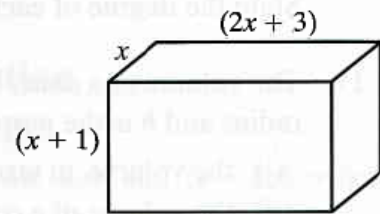
   width = $2x + 2$

(ii) $P = 2(3x-1)$ $=$ $6x - 2$
      $\quad + 2(2x+2)$ $\quad 4x + 4$
      $\qquad\qquad\qquad\qquad\overline{10x + 2}$

3. The dimensions (in cm) of an open rectangular box are given in the diagram. Find
    (a) an expression for the volume, $V(x)$, of the box
    (b) an expression for the external surface area, $S(x)$, of the box
    (c) the value of
        (i) $V(x)$ and (ii) $S(x)$ when $x = 5$.

10. Given $f(x) = x^2 - 3x + 6$, find
    (i) $f(-2t)$ (ii) $f(t^2)$ (iii) $f(t-2)$
    State the degree of each of the polynomial functions in t.

12. If $f(x) = 3x + 6$, find $f(10)$.

If $f(x) = 2x + 8$, find $f(10)$.

By studying the pattern of the results above, if $g(10) = 47$, write $g(x)$ in the form $ax + b$.