

## Challenge Problems 3.2

The cubic polynomial  $f(x)$  passes through  $(0, 4)$  and has zeros at  $x = 1, x = 3$ , and  $x = 5$ . Find  $f(4)$ .

Find the remainder when dividing  $x^9 + 2x^8 + 3x^7 + 4x^6 + \dots + 8x^2 + 9x + 10$  by  $x + 2$ .

Determine  $a$  and  $b$  such that  $2$  is a double zero (i.e.  $(x - 2)^2$ ) for the polynomial:

$$x^4 + (a - 2)x^3 + bx^2 + (a + b)x + 4$$