

MHF4U Chapter 3 Review (Factoring Polynomials)

Factor completely.

a) $P(x) = x^4 + x^2 - 6$

$$= (x - \sqrt{2})(x + \sqrt{2})(x^2 + 3)$$

b) $P(x) = x^4 + 2x^3 - x^2 - 4x - 2$

$$= (x + 1)^2 (x - \sqrt{2})(x + \sqrt{2})$$

c) $P(x) = 4x^4 + 8x^3 - 7x^2 - 11x + 6$

$$= (x - 1)(x + 2)(2x - 1)(2x + 3)$$
$$= 4(x - 1)(x + 2)\left(x - \frac{1}{2}\right)\left(x + \frac{3}{2}\right)$$

d) $P(x) = x^4 - x^3 - x^2 + x$

$$= x(x - 1)^2(x + 1)$$

$$e) P(x) = x^4 + 2x^3 - x^2 - 4x - 2$$

$$= (x+1)^2 (x-\sqrt{2}) (x+\sqrt{2})$$

$$f) P(x) = x^6 - 5x^4 + 7x^2 - 3$$

$$= (x-1)^2 (x+1)^2 (x-\sqrt{3}) (x+\sqrt{3})$$

$$g) P(x) = -3x^6 + 15x^4 - 18x^2$$

$$= -3x^2 (x-\sqrt{2}) (x+\sqrt{2}) (x-\sqrt{3}) (x+\sqrt{3})$$