[Tutorial 1]

Excercise 1

(a) $x1 = -1, y1 = 5, m = -2$ $y - y1 = m(x - x1)$ $y - 5 = -2(x + 1)$ $y - 5 = -2x - 2$ $y = -2x - 7$ $2x + y + 7 = 0$

(b) $(-1, -2), (1, 3)$ $+1$ $+2$ $+1$ $+2$ $(0, 0)$ $(2, 5)$; $m = 5/2$ $x1 = 1, y1 = 3, m = 5/2$ $y - (3) = (5/2)(x - (2))$ $y - 3 = 5/2(x) - 5/2(2)$ $2y - 6 = 5x - 10$ $5x - 2y - 4 = 0$

(c) $y = 7 - 3x$; $m = -3$ $y1 = 5, x1 = 0$; $m = -3$ $y - (5) = (-3)(x - 0)$ $y - 5 = -3x$ $3x + y - 5 = 0$

(d) $(1, 1)$ I $y = 2x - 5$; $m = 2$ I : $m = 2$, $m = -1/2$ $y1 = 1, x1 = 1, m = -1/2$ $y - (1) = (-1/2)(x - 1)$ $y - 1 = -1/2(x) + 1/2$ $2y - 2 = -x + 1$ $x + 2y - 3 = 0$

Excercise 2

(a)
(b)
(c)

Excercise 3

(a) $p(x) = x - 3$

(b) $p(x) = x - 3/2$

(c) $x^2 + 4x - 5 = (x - 1).p(x)$ $(x + 5)(x - 1) = (x - 1).p(x)$ $p(x) = x + 5$

(d) $x^3 + 4x^2 - 8 = (x + 2).p(x)$ $x^3 + 4x^2 + (4x - 4x) - 8 = (x + 2).p(x)$ $(x^2 + 2x)(x + 2) - 4x - 8 = (x + 2).p(x)$ $x^2 + 2x + (-4x - 8/x + 2) = p(x)$ $p(x) = x^2 + 2x - 4$

(e) $x^8 - 1 = (x - 1).p(x)$ $x^8 - (1)^8 = (x - 1).p(x)$ $(x - 1)^8 = (x - 1).p(x)$ $p(x) = (x - 1)^7$

(f) $x^4 - 2x^2 + 1 = (x^2 - 2x + 1).p(x)$ $(x^2 + 2x + 1)(x^2 - 2x + 1) = (x^2 - 2x + 1).p(x)$ $p(x) = x^2 + 2x + 1$

Excercise 4

(a) $f(x) = 0$ $x^2 = 49$ $x = 7$; $x = -7$ bottom opening(negative) $\therefore$ $-7 < x < 7$

(b) $f(x) = 0$ $x^2 - 5x - 6 = 0$ $(x - 6)(x + 1) = 0$ $x = 6$; $x = -1$ top opening(positive) $\therefore$ $x > 6, x < -1$

(c) $g(y) = 0$ $y^2 - 4y + 4 = 0$ $(y - 2)^2 = 0$ $y = 2$ top opening(positive) $\therefore$ $y < 2, y > 2$

(d) h(t) = 0 t^2 + 2t + 3 = 0 t^2 + 2t + 1 + 2 = 0 (t + 1)^2 = -2 t = -3 top opening(positive) $\therefore$ t < -3, t > -3

(e) g(x) = -x^2 + 3x - 2 -g(x) = (x - 2)(x - 1) x = 2, x = 1 bottom opening(negative) $\therefore$ x > 1, x < 2

(f) no roots y is always positive so h(x) never cuts the x axis