

U1/L2

Handout Q's

$$1. a) y = x^2 - 4x + 5$$

$$= (x^2 - 4x + 4) - 4 + 5$$

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

$$\therefore V: (2, 1)$$

$$b) y = 2x^2 + 16x + 30$$

$$= 2[x^2 + 8x + 16 - 16] + 30$$

$$= 2(x+4)^2 - 32 + 30$$

$$= 2(x+4)^2 - 2$$

$$\therefore V: (-4, -2)$$

$$c) y = -3x^2 + 9x - 2$$

$$= -3\left[x^2 - 3x + \frac{9}{4} - \frac{9}{4}\right] - 2$$

$$= -3\left(x - \frac{3}{2}\right)^2 + \frac{27}{4} - \frac{8}{4}$$

$$= -3\left(x - \frac{3}{2}\right)^2 + \frac{19}{4}$$

$$\therefore V\left(\frac{3}{2}, \frac{19}{4}\right)$$

$$d) y = 3x^2 - x + 1$$

$$= 3\left[\left(x^2 - \frac{1}{3}x + \frac{1}{36}\right) - \frac{1}{36}\right] + 1$$

$$= 3\left(x - \frac{1}{6}\right)^2 - \frac{1}{12} + \frac{12}{12}$$

$$= 3\left(x - \frac{1}{6}\right)^2 + \frac{11}{12}$$

$$\therefore V: \left(\frac{1}{6}, \frac{11}{12}\right)$$

$$e) y = 3(x-1)(x+1) - 4x^2$$

$$= 3(x^2 - 1) - 4x^2$$

$$= 3x^2 - 3 - 4x^2$$

$$= -x^2 - 3 \leftarrow \text{vertex form!}$$

$$\therefore V: (0, -3)$$

$$2. a) x^2 + 4x + 8 = 0$$

$$(x+8)(x+1) = 0$$

$$\therefore x = -8, -1$$

$$b) \frac{1}{2}x^2 + 5x - 2 = -10$$

$$\frac{1}{2}x^2 + 5x + 8 = 0$$

$$x^2 + 10x + 16 = 0$$

$$(x+8)(x+2) = 0$$

$$\therefore x = -8, -2$$

bis
mult by 2!

$$c) 5x^2 - 2x = 50$$

$$5x^2 - 2x - 50 = 0$$

$$(5x \cancel{\times \times}) = 0 \text{ NP}$$

$$x = \frac{2 \pm \sqrt{4 - 4(5)(-50)}}{2(5)}$$

$$= \frac{2 \pm \sqrt{1004}}{10}$$

$$\hat{=} 3.37 \text{ and } -2.97$$

$$d) 0 = 27x^2 - 12$$

$$27x^2 = 12$$

$$x^2 = \frac{12}{27}$$

$$x^2 = \frac{4}{9}$$

$$x = \pm \frac{2}{3}$$

$$\begin{array}{r|rr} 15 & 1 & 2 \\ 51 & 50 & 25 \end{array}$$

3. x -int, $y=0$

$$0 = 5x^2 + 7x - 6$$

$\leftarrow y$ -int

$$0 = (5x - 3)(x + 2)$$

$\therefore x = \frac{3}{5}, -2$

or $(\frac{3}{5}, 0)$ and $(-2, 0)$

y -int. is $(0, -6)$

Text p. 138 #5

a) $x^2 - 11x + 24 = 0$

$$(x - 8)(x - 3) = 0$$

$\therefore x = 8, 3$

b) $x^2 - 6x + 3 = 0$

$$x = \frac{6 \pm \sqrt{36 - 12}}{2} = \frac{6 \pm \sqrt{24}}{2} = 3 \pm \sqrt{6}$$

$= 5.45$ and 0.55

text says 1.67, but $\frac{3}{5}$ is preferred

c) $3x^2 - 2x - 5 = 0$

$$(3x - 5)(x + 1) = 0$$

$\therefore x = \frac{5}{3}, -1$

d) $3x^2 + 2x = x^2 + 9x - 3$

$$2x^2 - 7x + 3 = 0$$

$$(2x - 1)(x - 3) = 0$$

$\therefore x = \frac{1}{2}, 3$

p. 177

#1 a) $x^2 + 5x + 4 = 0$

$$(x + 4)(x + 1) = 0$$

$\therefore x = -4, -1$

1. c) $4x^2 - 9 = 0$

$$4x^2 = 9$$

$$x^2 = \frac{9}{4}$$

$$x = \pm \frac{3}{2}$$

1. b) $x^2 - 11x + 18 = 0$

$$(x - 9)(x - 2) = 0$$

$\therefore x = 9, 2$

1. d) $2x^2 - 7x - 4 = 0$

$$(2x + 1)(x - 4) = 0$$

$\therefore x = -\frac{1}{2}, 4$

2. b) $3x^2 + 2x - 8 = 0$

$$x = \frac{-2 \pm \sqrt{4 + 96}}{6} = \frac{-2 \pm \sqrt{100}}{6} = \frac{-2 \pm 10}{6}$$

$= -\frac{12}{6} = -2$ and $-\frac{8}{6} = -\frac{4}{3}$

2. a) $x^2 - 4x - 9 = 0$

$$x = \frac{4 \pm \sqrt{16 + 36}}{2} = \frac{4 \pm \sqrt{52}}{2} = 2 \pm \sqrt{13}$$

$= 5.61$ and -1.61

2. c) $-2x^2 + 3x - 6 = 0$ factor out -1

$$2x^2 - 3x + 6 = 0$$

$$x = \frac{3 \pm \sqrt{9 - 48}}{4}$$

$= 3 \pm \sqrt{-39}$

$\therefore$ no real roots

2. d) $0.5x^2 - 2.2x - 4.7 = 0$

$$x = \frac{2.2 \pm \sqrt{4.84 + 9.4}}{2(0.5)}$$

$= 2.2 \pm \sqrt{14.24}$

$= 5.97$ and -1.57