

USE FACTORS TO SOLVE:

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

$$(x + 1)(x - 6) = 0$$

$$\begin{array}{l|l} x + 1 = 0 & x - 6 = 0 \\ x = -1 & x = 6 \end{array}$$

SOLVE USING FACTORS

$$y^2 - 5y = 0$$

$$y(y - 5) = 0$$

$$\begin{array}{l|l} y = 0 & y - 5 = 0 \\ & y = 5 \end{array}$$

USE FACTORS TO SOLVE

$$4t^2 - 100 = 0$$

$$t^2 - 25 = 0$$

$$(t+5)(t-5) = 0$$

$$\begin{array}{l|l} t+5=0 & t-5=0 \\ t=-5 & t=5 \end{array}$$

2nd method

$$4t^2 - 100 = 0$$

$$4t^2 = 100$$

$$t^2 = 25$$

$$t = \pm 5$$

Solve:  $x - 6 = \frac{3}{x}$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

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

$$a = 1$$

$$b = -6$$

$$c = -3$$

$$\begin{aligned} x &= \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-3)}}{2(1)} = \frac{6 \pm \sqrt{36 + 12}}{2} \\ &= \frac{6 \pm \sqrt{48}}{2} = \frac{6 \pm 4\sqrt{3}}{2} = 3 \pm 2\sqrt{3} \end{aligned}$$

SOLVE  $x^4 + x^2 - 6 = 0$

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

$$x^2 - 2 = 0$$

$$x^2 = 2$$

$$x = \pm\sqrt{2}$$

$$x^2 + 3 = 0$$

$$x^2 = -3$$

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

Homework: 12-10-2012

Exercise 2.1

Q1 e (i)

$$\text{SOLVE } 15 - 7x - 2x^2 = 0$$

$$\Rightarrow 2x^2 + 7x - 15 = 0$$

$$(2x - 3)(x + 5) = 0 \quad \checkmark$$

-3x  
+20x

$$\begin{array}{l|l} 2x - 3 = 0 & x + 5 = 0 \\ 2x = 3 & x = -5 \\ x = 3/2 & \end{array}$$

Q3 a(i)

leaving your answer in surd form  
use the quadratic formula to solve

$$3x^2 + 4x - 5 = 0$$

$$a = 3$$

$$b = 4$$

$$c = -5$$

$$X = \frac{-4 \pm \sqrt{(4)^2 - 4(3)(-5)}}{2(3)}$$

$$= \frac{-4 \pm \sqrt{76}}{6} = \frac{-4 \pm 2\sqrt{19}}{6} = \frac{-2 \pm \sqrt{19}}{3}$$

Q3 (a) ii

use the quadratic formula to solve  
leaving your answer in surd form

$$2x^2 - 12x - 5 = 0$$

$$a = 2$$

$$b = -12$$

$$c = -5$$

$$\begin{aligned}
 X &= \frac{+12 \pm \sqrt{(-12)^2 - 4(2)(-5)}}{2(2)} = \frac{12 \pm \sqrt{184}}{4} \\
 &= \frac{6 \pm \sqrt{46}}{2}
 \end{aligned}$$

Q3  
a  
(ii)

leaving your answer in surd form  
use the quadratic formula to solve

$$(2x-3)^2 = 8$$

$$4x^2 - 12x + 9 = 8$$

$$4x^2 - 12x + 1 = 0$$

$$a = 4$$

$$b = -12$$

$$c = 1$$

$$\begin{aligned}
 X &= \frac{+12 \pm \sqrt{(-12)^2 - 4(4)(1)}}{2(4)} = \frac{12 \pm \sqrt{128}}{8} \\
 &= \frac{12 \pm 8\sqrt{2}}{8} = \frac{3 \pm 2\sqrt{2}}{2} \quad \checkmark
 \end{aligned}$$

p.50 Q5 a (ii)

Solve:

$$x^4 - 2x^2 - 2 = 0$$

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

$$x^2 + 1 = 0$$

$$x^2 = -1 \quad \checkmark$$

$$x = \pm \sqrt{-1}$$

$$x^2 = 2$$

$$x = \pm \sqrt{2} \quad \checkmark$$

(i)  $5x^2 - 13x - 6 = 0$

$$(5x + 2)(x - 3) = 0 \quad \checkmark$$

$\overset{+2x}{\curvearrowright}$   
 $\underset{-15x}{\curvearrowleft}$

$$5x + 2 = 0$$

$$5x = -2$$

$$x =$$

$$\frac{-2}{5}$$

$$x = 3$$

$$(ii) 9x^2 + 3x - 20 = 0$$

$$(3x - 4)(3x + 5) = 0 \quad \checkmark$$

$$x = \frac{4}{3} \quad | \quad x = -\frac{5}{3}$$

$$(iii) 8x^2 - 2x - 15 = 0$$

$$(4x + 5)(2x - 3) = 0 \quad \checkmark$$

$$x = -\frac{5}{4} \quad | \quad x = \frac{3}{2}$$

Q5 a (i)

$$x^4 - 7x^2 + 10 = 0$$

$$(x^2 - 2)(x^2 - 5) = 0$$

$$x^2 = 2$$

$$x^2 = 5$$

$$x = \pm\sqrt{2}$$

$$x = \pm\sqrt{5}$$

Q4 a (1)

$$\frac{x+7}{3} + \frac{2}{x} = 4$$

$$x^2 + 7x + 6 = 12x$$

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

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

$$x = 2 \quad | \quad x = 3$$



Q4<sup>a</sup> (ii)

$$\frac{1}{x-1} + \frac{4}{x} = 3$$

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

$$5x - 4 = 3x^2 - 3x$$

$$3x^2 - 8x + 4 = 0$$

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

$$x = \frac{2}{3} \quad | \quad x = 2$$

Q4 (iii) a

$$\frac{3}{x-1} - \frac{2}{x+1} = 1$$

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

$$3x+3 - 2x+2 = x^2-1$$

$$x+5 = x^2-1$$

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

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

$$x = 3 \quad | \quad x = -2$$