INTRODUCTION TO POLYNOMIALS

SIMPLIFYING EXPRESSIONS

Question 8

Simplify fully the following expressions.

a) $4\left(x^2-3x\right)-(x+1)(x+4)=$

b) $2\left(3x^2-5\right)-(x+2)(x-3)=$

c) $4\left(2x^2-3\right)-(x-4)(x+5)=$

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

e) $6x-x(2-x)-2(x-1)(x+2)=$

Question 9

Expand the brackets and simplify fully the following expressions.

a) $(x+3)(x+1)(x+1)$

b) $(x-2)(x-5)(x+1)$

c) $(x-2)(x-3)(x+4)$

d) $(x-3)(x+2)(x+4)$

e) $(x+1)(x+2)(x-1)(x-3)$

Question 10

Expand the brackets and simplify fully the following expressions.

a) $(2x-1)(x-1)(x-2)$

b) $(x-1)(2x-3)(x+2)$

c) $(3x-1)(x+2)(3x+2)$

d) $(1+2x)(3-x)(1-x)$

e) $(x-3)(x-1)(x-2)(x+1)$

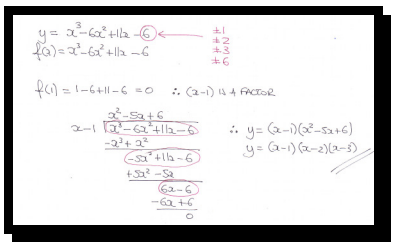
FACTORIZING POLYNOMIALS

Question 1

$$y = x^3 - 6x^2 + 11x - 6 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-1)(x-2)(x-3)}$$

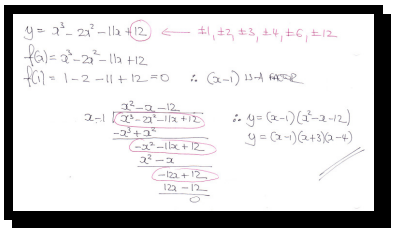


Question 2

$$y = x^3 - 2x^2 - 11x + 12 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-1)(x+3)(x-4)}$$

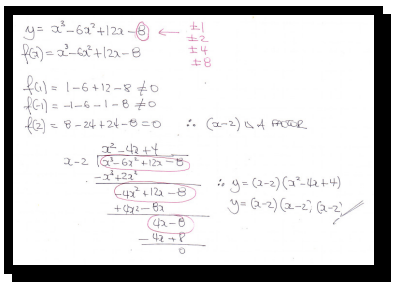


Question 3

$$y = x^3 - 6x^2 + 12x - 8 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-2)(x-2)(x-2)}$$

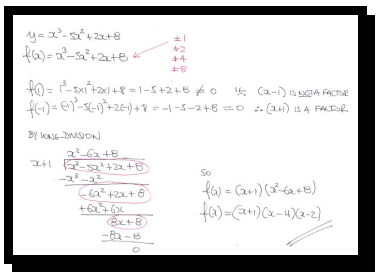


Question 4

$$y = x^3 - 5x^2 + 2x + 8 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x+1)(x-4)(x-2)}$$

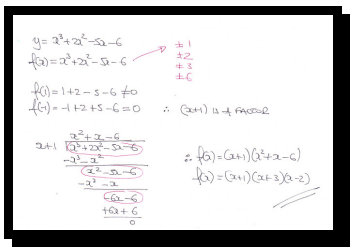


Question 5

$$y = x^3 + 2x^2 - 5x - 6 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x+1)(x+3)(x-2)}$$

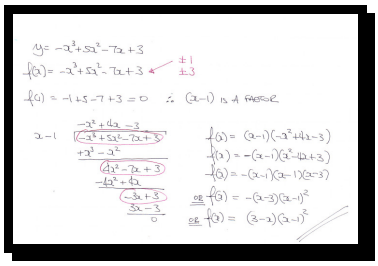


Question 6

$$y = -x^3 + 5x^2 - 7x + 3 .$$

Express y as a product of three linear factors.

$$\boxed{y = (3-x)(x-1)^2}$$

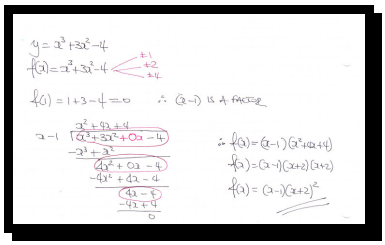


Question 7

$$y = x^3 + 3x^2 - 4 .$$

Express y as a product of three linear factors.

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

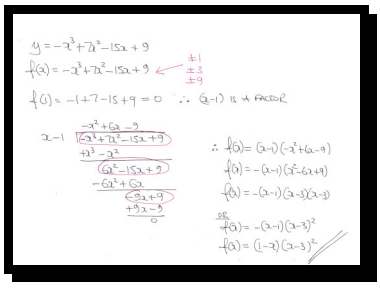


Question 8

$$y = -x^3 + 7x^2 - 15x + 9 .$$

Express y as a product of three linear factors.

$$\boxed{y = (1-x)(x-3)^2}$$

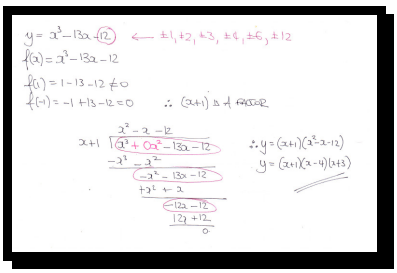


Question 9

$$y = x^3 - 13x - 12 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x+1)(x+3)(x-4)}$$

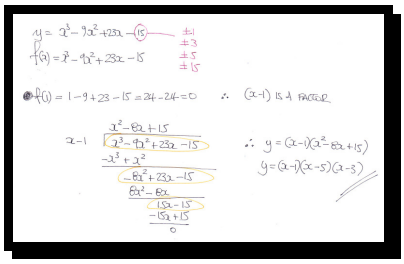


Question 10

$$y = x^3 - 9x^2 + 23x - 15 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-1)(x-3)(x-5)}$$

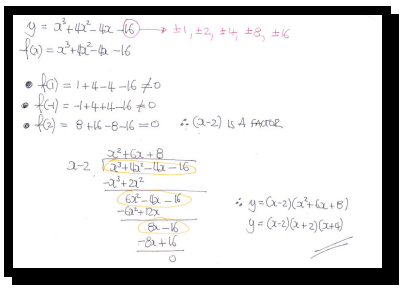


Question 11

$$y = x^3 + 4x^2 - 4x - 16 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-2)(x+2)(x+4)}$$

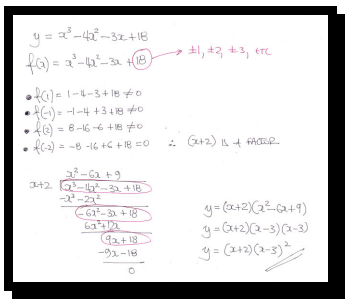


Question 12

$$y = x^3 - 4x^2 - 3x + 18 .$$

Express y as a product of three linear factors.

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

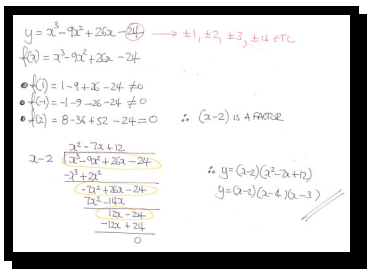


Question 13

$$y = x^3 - 9x^2 + 26x - 24 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x-2)(x-3)(x-4)}$$

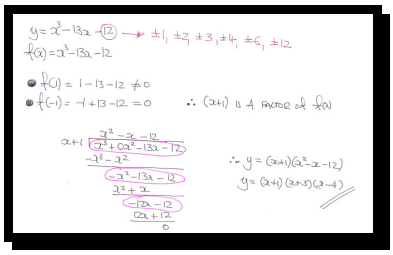


Question 14

$$y = x^3 - 13x - 12 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x+1)(x+3)(x-4)}$$

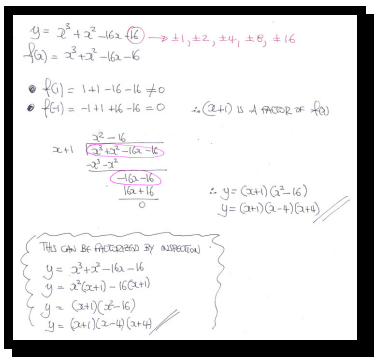


Question 15

$$y = x^3 + x^2 - 16x - 16 .$$

Express y as a product of three linear factors.

$$\boxed{y = (x+1)(x+4)(x-4)}$$



SOLVING POLYNOMIAL EQUATIONS

Question 1

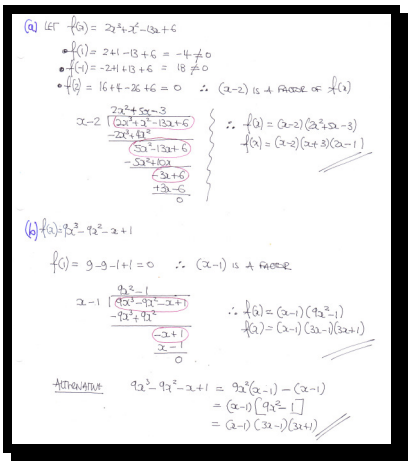
Factorize each of the following cubics into three linear factors.

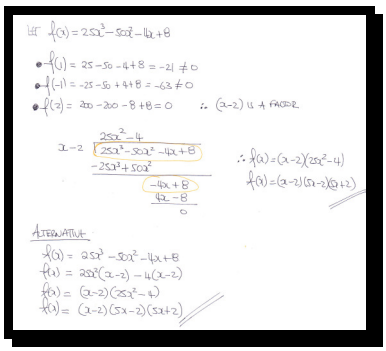
a) $2x^3+x^2-13x+6$

b) $9x^3-9x^2-x+1$

c) $25x^3-50x^2-4x+8$

$\boxed{(x-2)(x+3)(2x-1)}$, $\boxed{(x-1)(3x+1)(3x-1)}$, $\boxed{(x-2)(5x+2)(5x-2)}$





Question 2

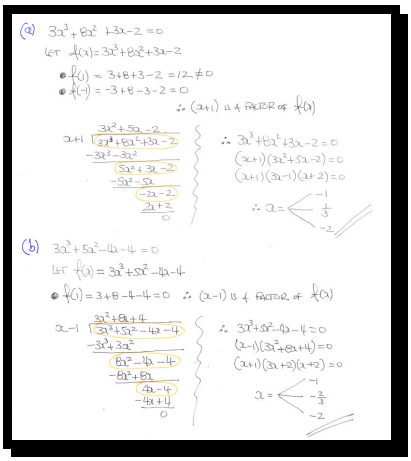
Solve the following cubic equations

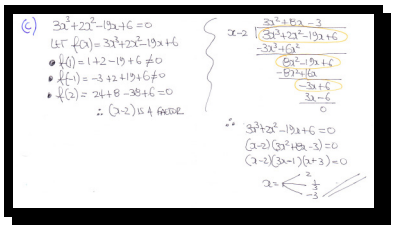
a) $3x^3+8x^2+3x-2=0$

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

c) $3x^3+2x^2-19x+6=0$

$$\boxed{x=-1,-2,\frac{1}{3}}\ ,\quad \boxed{x=1,-2,-\frac{2}{3}}\ ,\quad \boxed{x=-3,2,\frac{1}{3}}$$





Question 3

Solve the following cubic equations

a) $6x^3-7x^2-14x+8=0$

b) $8x^3-14x^2-7x+6=0$

$$\boxed{x=\frac{1}{2},2,-\frac{4}{3}}\ ,\quad \boxed{x=-\frac{3}{4},\frac{1}{2},2}$$

