departamento de matemática universidade de aveiro

1. Preencha a seguinte tabela:

monómio	coeficiente	parte literal	grau
$-\frac{x}{4}$			
	9	$a^2b^4c^5$	
$7x^3$			
	3	x^2yz^4	
$5x^3y$			
	-2	z^3b^2	
-10			
	13	xy^4	
$-8xyz^2$			
	$\frac{1}{2}$	abc	
$5x^2y^3$			

2. Transforme num polinómio reduzido:

(a) $(3x^2 - 6x + 5) - (-5x^2 + 8x)$

(b) $(a^4 + 3a^2 - a) + (2a^2 + 5a)$

(c) $\left(\frac{5}{2}x^3 - 3x^2 + 7x\right) - \left(3x^2 + 12x - 3\right)$

(d) $2(x + 4) - 3(x^2 - 2x + 7)$

(e) $2 - \left(\frac{1}{2}a^2 + 3x - a\right) + \left(\frac{a^2 + 1}{2}\right)$

(f) $\frac{1}{10}y - 3(y + x) - \frac{y + 1}{2}$

(g) $-\frac{a^2 + a}{2} + 3 - \frac{2}{3}a$

(h) $(3x - 2)(-x + 5)$

(i) $\left(y - \frac{1}{2}\right)(2x + 6)$

(j) $2x^2\left(-3x^2\right) + \left(10x^3\right)^2$

(k) $\left(\frac{1}{3}y\right)^2 - 10\left(\frac{4}{10}y - \frac{1}{3}y^2\right)$

(l) $\left(x^2 - 2x + \frac{1}{4}\right)\left(\frac{x}{2} - 1\right)$

(m) $(x + 5)(3x + 1) - 2(x^2 - 3)$

(n) $-\frac{x + 1}{3} - (3x - 1)$

(o) $x + (3x - 5) - 5x - (2x + 2)$

(p) $(2a - 3)^2$

(q) $\left(b + \frac{1}{3}\right)^2$

(r) $\left(2y + \frac{1}{5}\right)^2 - (y - 1)^2$

(s) $\left(\frac{a}{7} - \frac{2}{3}\right)^2$

(t) $\left(\frac{1}{3}b - \frac{1}{5}\right)\left(\frac{1}{3}b + \frac{1}{5}\right)$

3. Fatorize os seguintes polinómios:

(a) $6x^4 + 10xy^2$

(b) $14m^3 + 7m^2n$

(c) $12x^4 - 14x^3 + 70x^2$

(d) $7a^5 - 21a^4 + 14a^3$

(e) $x^7 + x^8 + x^9$

(f) $3xy - 5axy^2 - 6bx^2y$

(g) $5x(2x + 3y) - 2x(2x + 3y)$

(h) $2(x + 2y) + m(x + 2y)$

(i) $x(x + 5) + 2(x + 5)$

(j) $x(y - 3) + 5(y - 3)$

(k) $x^2(x + 1) + 1(x + 1)$

(l) $9(m + n) - a(m + n)$

(m) $a^2\left(a^3 - a^2\right) + b\left(a^3 - a^2\right)$

(n) $9x^2 - 18x - 27$

(o) $7x^2 + 14x + 21$

(p) $28x^2 - 14x + 7$

(q) $25a^2 + 10a + 1$

(r) $64a^2 - 80a + 25$

(s) $16x^2 + 8xy + y^2$

(t) $16x^2 - 81$

(u) $81x^2 - 225$

(v) $9x^2 - 144$

(w) $25 - 36a^2$

(x) $\frac{1}{9}x^2 - 49$

(y) $\frac{1}{64}y^2 - \frac{81}{4}x^2$

(z) $x^4 - 16a^4$

4. Resolva as seguintes equações do 2º grau e indique o conjunto solução.

(a) $3x^2 + 5x = 0$

(b) $x^2 - 10x + 24 = 0$

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

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

(e) $4x^2 + 6x = 0$

(f) $3x^2 + 9 = 0$

(g) $9x^2 - 24x + 16 = 0$

(h) $2x(x + 7) + 5 = 0$

(i) $5x^2 + 3x - 2x^2 + 3 = 3x^2 - 1 + x$

(j) $\frac{x^2}{3} - \frac{3(x-4)}{2} = -2(x - 3)$

(k) $(3x + 2)^2 = (2x + 1)^2 + (x + 3)^2$

(l) $-5(-2 - x^2) - (x - 3) = -x - 2$

(m) $3(x^2 + 2) - x(x + 1) = 24 - x$

(n) $(x - 4)(x + 1) = 10 - 3x$

(o) $5x + (x + 2)^2 = 3x(x + 2) + x$

(p) $(x + 3)(x + 4) = 2x(2x - 1)$

(q) $(x + 2)(x - 2) - (x - 1)^2 = x^2 - 8$

(r) $x(3x + 1) + 6x - 2 = 1 - x$

(s) $\frac{x^2 - 1}{4} = \frac{x - 1}{3}$

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

1.

monómio	coeficiente	parte literal	grau
	$-\frac{1}{4}$	x	1
$9a^2b^4c^5$			11
	7	x^3	3
$3x^2yz^4$			7
	5	x^3y	4
$-2z^3b^2$			5
	-10	não tem	0
$13xy^4$			5
	-8	xyz^2	4
$\frac{1}{2}abc$			3
	5	x^2y^3	5

2. (a) $8x^2-14x+5$; (b) a^4+5a^2+4a; (c) $\frac{5}{2}x^3-6x^2-5x+3$; (d) $-3x^2+8x-13$; (e) $-3x+a+\frac{5}{2}$; (f) $-\frac{17}{5}y-3x-\frac{1}{2}$; (g) $-\frac{1}{2}a^2-\frac{7}{6}a+3$; (h) $-3x^2+17x-10$; (i) $2xy-x+6y-3$; (j) $10x^6-6x^4$; (k) $\frac{31}{9}y^2-4y$; (l) $\frac{1}{2}x^3-2x^2+\frac{17}{8}x-\frac{1}{4}$; (m) $x^2+16x+11$; (n) $\frac{2-10x}{3}$; (o) $-3x-7$; (p) $4a^2-12a+9$; (q) $b^2+\frac{2}{3}b+\frac{1}{9}$; (r) $3y^2+\frac{14}{5}y-\frac{24}{25}$; (s) $\frac{a^2}{49}-\frac{4a}{21}+\frac{4}{9}$; (t) $\frac{b^2}{9}-\frac{1}{25}$.

3. (a) $2x(3x^3+5y^2)$; (b) $7m^2(2m+n)$; (c) $2x^2(6x^2-7x+35)$; (d) $7a^3(a^2-3a+2)$; (e) $x^7(1+x+x^2)$; (f) $xy(3-5ay-6bx)$; (g) $3x(2x+3y)$; (h) $(2+m)(x+2y)$; (i) $(x+2)(x+5)$; (j) $(x+5)(y-3)$; (k) $(x^2+1)(x+1)$; (l) $(9-a)(m+n)$; (m) $a^2(a^2+b)(a-1)$; (n) $9(x^2-2x-3)$; (o) $7(x^2+2x+3)$; (p) $7(4x^2-2x+1)$; (q) $(5a+1)^2$; (r) $(8a-5)^2$; (s) $(4x+y)^2$; (t) $(4x+9)(4x-9)$; (u) $(9x+15)(9x-15)$; (v) $(3x+12)(3x-12)$; (w) $(5+6a)(5-6a)$; (x) $\left(\frac{1}{3}x+7\right)\left(\frac{1}{3}x-7\right)$; (y) $\left(\frac{1}{8}y+\frac{9}{2}x\right)\left(\frac{1}{8}y-\frac{9}{2}x\right)$; (z) $(x^2+4a^2)(x^2-4a^2)$.

4. (a) $\{-\frac{5}{3},0\}$; (b) $\{4,6\}$; (c) $\{1,3\}$; (d) $\{\ \}$; (e) $\{-\frac{3}{2},0\}$; (f) $\{\ \}$; (g) $\{\frac{4}{3}\}$; (h) $\left\{\frac{-14-\sqrt{156}}{4},\frac{-14+\sqrt{156}}{4}\right\}$; (i) $\{-2\}$; (j) $\{-\frac{3}{2},0\}$; (k) $\{-\frac{3}{2},1\}$; (l) $\{\ \}$; (m) $\{-3,3\}$; (n) $\{-\sqrt{14},\sqrt{14}\}$; (o) $\{-1,2\}$; (p) $\{-1,4\}$; (q) $\{-1,3\}$; (r) $\{\frac{1}{3},-3\}$; (s) $\{1,\frac{1}{3}\}$; (t) $\{-\frac{1}{2},5\}$.