POLYNOMIALS 2

1. Work out:

a) $(x^5 - 2x^3 + 3x - 4) - 2(x^4 - 2x^3 + 3x - 2) =$

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

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

d) $-5x^2y \cdot (x^2y - 3xy^2 + 4xy - 2) =$

e) $(x^3 - 5x^2 - 2) \cdot (x^2 + 5) =$

f) $(3xy) \cdot (2x^2y^4) - (2x^2y^3) \cdot (-4xy^2) =$

g) $(x + y)(x^2 - 2xy + y^2) =$

2. Factorise the following expressions:

a) $mn - 4m^2 - 5m =$

b) $5xy^2 + 10xy + 5x =$

c) $12x^3y^4 - 8y^3x^2 =$

d) $x^4 - 25x^2 =$

e) $4x^4 + 4x^3 + x^2 =$

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

g) $x^4 - 12x^2 + 36$

h) $100 - 9a^2 =$

i) $25x^2y - y =$

j) $16a^2b - 9b =$

k) $3a^3 - 27ab^4 =$

3. Fill in the gaps:

a) $(\quad + 2)^2 = x^2 + \quad +$

b) $(x - \quad)^2 = \quad - 6x + 9$

c) $(m \quad)^2 = \quad - 2mn +$

d) $(x - \quad)(x + \quad) = \quad - 36$

e) $(\quad + \quad)^2 = 16 \quad + 9t^2$

f) $(\quad - 3w)^2 = 4 - \quad +$

SOLUTION

1. Work out:

a) $(x^5-2x^3+3x-4)-2(x^4-2x^3+3x-2)=x^5-2x^3+3x-4-2x^4+4x^3-6x+4=$
$=x^5-2x^4+2x^3-3x$

b) $(x^3-x+2)-3(x^2+2x-3)-2(x+1)^2=x^3-x+2-3x^2-6x+9-2(x^2+2x+1)=$
$=x^3-x+2-3x^2-6x+9-2x^2-4x-2=x^3-5x^2-11x+9$

c) $-2(2x^4-x^3+5x)-3\cdot(x^2-2)(x^2+2)=-4x^4+2x^3-10x-3(x^4-4)=-7x^4+2x^3-10x+12$

d) $-5x^2y\cdot(x^2y-3xy^2+4xy-2)=-5x^4y^2+15x^3y^3-20x^3y^2-20x^3y^2+10x^2y$

e) $(x^3-5x^2-2)\cdot(x^2+5)=x^5-5x^4-2x^2+5x^3-25x^2-10=x^5-5x^4+5x^3-27x^2-10$

f) $(3xy)\cdot(2x^2y^4)-(2x^2y^3).(-4xy^2)=6x^3y^5+8x^3y^5=14x^3y^5$

g) $(x+y)(x^2-2xy+y^2)=x^3-2x^2y+xy^2+x^2y-2xy^2+y^3=x^3-x^2y-xy^2+y^3$

2. Factorise the following expressions:

a) $mn-4m^2-5m=m(n-4m-5)$

b) $5xy^2+10xy+5x=5x(y^2+2y+1)=5x(y+1)^2$

c) $12x^3y^4-8y^3x^2=4x^2y^3(3xy-2)$

d) $x^4-25x^2=x^2(x^2-25)=x^2(x+5)(x-5)$

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

f) $x(x-2)+x(x-1)=x(x-2+x-1)=x(2x-3)$

g) $x^4-12x^2+36=(x^2-6)^2$

h) $100-9a^2=(10+3a)(10-3a)$

i) $25x^2y-y=y(25x^2-1)=y(5x+1)(5x-1)$

j) $16a^2b-9b=b(16a^2-9)=b(4a+3)(4a-3)$

k) $3a^3-27ab^4=3a(a^2-9b^4)=3a(a+3b^2)(a-3b^2)$

3. Fill in the gaps:

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

b) $(x-3)^2=x^2-6x+9$

c) $(m-n)^2=m^2-2mn+n^2$

d) $(x-6)(x+6)=x^2-36$

e) $(4+3t)^2=16+12t+9t^2$

f) $(2-3w)^2=4-24w+9w^2$