

## Fourteenth Set of Homework for Math 05

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**Please note:** You should fully justify your answers.

### 1 Factoring by identifying common factors

1. Factor out the Greatest Common Factor for each of the following polynomials:

(a)  $6x^2 - 3x$        $3x(x - 2)$

(b)  $4x^5 - 6x^4 + 8x^2$        $2x^2(2x^3 - 3x + 8)$

(c)  $2a^3b - 72ab^3$        $2ab(a^2 - 36b^2)$

(d)  $14x^2y^3 - 21x^4y - 7x^3y^2$        $7x^2y(2y - 3x^2 - xy)$

(e)  $-9a^2b^3c^6 - 18a^4bc^2 + 81a^3b^4c^3$        $-9a^2bc^2(b^2c^4 + 2a^2 - 9ab^3c)$

(f)  $-11x^5y^3z^8 + 22x^3y^5z^2 - 55x^4y^2z^4 + 33x^2y^5z^4$        $11x^2y^2z^2(-x^3yz^6 + 2xy^3 + 5x^2z^2 + 3y^3z^2)$

2. Factor the following:

(a)  $3(x - 5) + 7x(x - 5)$        $(x - 5)(7x + 3)$

(b)  $x(4x - 7) + 9(7 - 4x)$        $(4x - 7)(x - 9)$

(c)  $-2x(3x + 7) + 3x + 7$        $(3x + 7)(1 - 2x)$

(d)  $5x(8x - 5) - 8x + 5$        $(8x - 5)(5x - 1)$

(e)  $3(x - 2)^2 - 6x(x - 2)$        $-3(x + 2)(x - 2)$

### 2 Factoring by grouping

1. Factor the following:

(a)  $ax - ay + bx - by$        $(a + b)(x - y)$

(b)  $10x^2 - 16xy^2 + 24y^3 - 15yx$        $(3y - 2x)(8y^2 - 5x)$

(c)  $3a^2x - 4a^2 + 6b^2x - 8b^2$        $(a^2 + 2b^2)(3x - 4)$

(d)  $2ax - 3ay + 2bx - 3by + 3cy - 2cx$        $(c - b - a)(3y - 2x)$

(e)  $x^2 + 2x + 8x + 16$        $(x + 2)(x + 8)$

(f)  $a^4 - 3a^2 + 4a^2 - 12$        $a^4 + a^2 - 12$        $2(a^2 - 6)$

(g)  $6x^2 - 21x + 2x - 7$        $(3x + 1)(2x - 7)$