

Factoring Polynomials Review, Exercise 6

[39 marks total]

Name: _____

Date: _____

Factor fully each of the following, showing steps where necessary. Do your work on this sheet. Rough work need not be shown.

1) $48x^2 + 36x = (12x)(4x+3)$

2) $14x^4y + 35x^3y^4 = (7x^3y)(2x + 5y^3)$

3) $8x^3y^2 + 4x^2y - 12x^4y = 4x^2y(2xy + 1 - 3x^2)$

4) $x^2 - 60x + 851 = (x - 37)(x - 23)$

5) $x^2 + 57x + 602 = (x + 14)(x + 43)$

6) $x^2 + 19x - 966 = (x - 23)(x + 42)$

7) $x^2 - 34x - 1827 = (x - 63)(x + 29)$

8) $121a^2 - 64b^2 = (11a + 8b)(11a - 8b)$

9) $36a^4b^2 - 49a^2b^4 = (6a^2b^2 + 7a^2b^3)(6a^2b^2 - 7a^2b^3)$
 $= (a^2b^2)(6a + 7b)(6a - 7b)$

10) $16x^4 - 81y^4 = (4x^2 - 9y^2)(4x^2 + 9y^2)$
 $= (2x^2 + 3y)(2x^2 - 3y)(4x^2 + 9y^2)$

11) $81x^2 - 126x + 49 = (9x - 7)^2$

12) $289n^2 + 646n + 361 = (17n + 19)^2$

13) $63x^2 - 62x + 15 = (7x - 3)(9x - 5)$

14) $108a^2 + 69ab - 77b^2 = (12a - 7b)(9a + 11b)$

15) $50b^2 - 85b - 117 = (10b + 9)(5b - 13)$

16) $91n^2 + 201mn + 108m^2 = (9m + 7n)(12m + 13n)$

Factoring Polynomials, Exercise 6 (continued)

$$17) (ab)^4 - 81 = (a^2b^2 + 9)(a^2b^2 + 9)$$

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

$$18) 3m^5 - 27n^4 = (m^3 - 3n^2)(m^3 + 3n^2)(\sqrt{3})(\sqrt{3})$$

$$= (m^3 - 3n^2)(m^3 + 3n^2)(3)$$

$$19) 144a^6 - 169a^4b^{10} = (12a^3 - 13a^2b^5)(12a^3 + 13a^2b^5)$$

$$= (a^2)(12a + 13b^5)(12a - 13b^5)$$

$$20) 49a^2 - 56a + 16 = (7a - 4)^2$$

$$21) 54x^2 + 180x + 150 = 6(9x^2 + 30x + 25)$$

$$= 6(3x+5)^2$$

$$22) x^4 - (x-2)^4 = (x^2 - (x-2)^2)(x^2 + (x-2)^2)$$

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

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

$$= 4(x-1)(x^2 + (x-2)^2)$$

$$23) 36a^4b^2 - 16a^2b^6 = 4a^4b^2(9 - 4a^2b^4)$$

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

$$24) 16d^3f - 64d^2f + 48df = 16df(d^2 - 4d + 3)$$

$$= 16df(d-3)(d-1)$$

$$25) (x^2 - 3x)^2 - (x-3)^2 = x^4 - 9x^2 - x^2 - 9$$

$$= x^4 - 10x^2 - 9$$

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

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