

Mixed Factoring Review

Common Factor	$2x^3 + 4x^7$ $5xy + 10xy^2 - 5$	<ul style="list-style-type: none"> - binomial or trinomial - large exponents - more than one variable
Trinomials 1	$x^2 + 4x + 3$ $2x^2 - 4x - 6$	<ul style="list-style-type: none"> - trinomial - may have GCF - first term is x^2
Trinomials 2	$2x^2 + 7x - 4$	<ul style="list-style-type: none"> - trinomial - no GCF - first term is x^2
Difference of Squares	$x^2 - 9$ $16a^2 - 49b^2$	<ul style="list-style-type: none"> - binomial - must have a negative - perfect squares

When solving:

1) Look for GCF and common factor it out of all terms.

2) Look for one of the following:

- Trinomial 1

$$x^2 + 3x - 4$$

$$\begin{array}{c} -4 \\ +4 \quad -1 \\ \hline 3 \end{array}$$

$$(x + 4)(x - 1)$$

- Trinomial 2

$$8x^2 + \underline{10x} + 3$$

$$(8)(3) = 24$$

$$\begin{array}{c} 4 \quad 6 \end{array}$$

$$(8x^2 + 4x) + (6x + 3)$$

$$4x(2x + 1) + 3(2x + 1)$$

$$(2x + 1)(4x + 3)$$

- Difference of Squares

$$\sqrt{4x^2} - \sqrt{49}$$

$$(2x + 7)(2x - 7)$$

3) Factor using strategies for one of the three types. If no other factors then it was only a common factoring question.

ex 1) $15x - 24y$ GCF (1 mark)

$$3(5x - 8y)$$

ex 2) $3x^2 - 48$ GCF (2 marks)

$$3(x^2 - 16) \text{ D of S}$$

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

ex 3) $3x^3 - 12x^2 - 36x$ GCF (2 marks)

$$3x(x^2 - 4x - 12) \text{ TRI 1} \quad \frac{3x^3}{3x} - \frac{12x^2}{3x} - \frac{36x}{3x}$$

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

$$\begin{array}{r} -12 \\ -6 \quad 2 \\ -4 \end{array}$$

ex 4) $8x^2 - 14x + 3$

$$(8x^2 - 2x) - (12x + 3) \text{ TRI 2 (2 marks)}$$

$$2x(4x-1) - 3(4x-1) \quad (8)(3) = 24$$

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

$$-2 \quad -12$$

ex 5) $x^2 - 5x - 36$

$$\text{TRI 1 (1 mark)}$$

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

$$\begin{array}{r} -36 \\ 4 \quad -9 \\ -5 \end{array}$$

ex 6) $\sqrt{9a^2b^2} - \sqrt{4c^4}$

$$\text{D of S (1 mark)}$$

$$(3ab - 2c^2)(3ab + 2c^2)$$

ex 7) $2x^4 - 4x + 8$

$$\text{GCF (1 mark)}$$

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

Difference of Squares

$$1. x^2 - y^4 \\ = (x+y^2)(x-y^2)$$

$$2. 4x^2 - 25y^2 \\ = (2x+5y)(2x-5y)$$

$$3. 9a^2 - 100b^2 \\ = (3a+10b)(3a-10b)$$

$$4. 81m^2 - 121n^2 \\ = (9m+11n)(9m-11n)$$

$$5. \frac{1}{4}t^2 - \frac{1}{9}s^2 \\ = \left(\frac{1}{2}t + \frac{1}{3}s\right)\left(\frac{1}{2}t - \frac{1}{3}s\right)$$

$$6. \frac{4}{9}c^2 - \frac{9}{16}d^2 \\ = \left(\frac{2}{3}c + \frac{3}{4}d\right)\left(\frac{2}{3}c - \frac{3}{4}d\right)$$

$$7. x^2 - 16 \\ = (x+4)(x-4)$$

$$8. 9y^2 - 64 \\ = (3y+8)(3y-8)$$

$$9. x^2y^2 - 4 \\ = (xy+2)(xy-2)$$

$$10. m^2 - 225 \\ = (m+15)(m-15)$$

$$11. 144 - y^2 \\ = (12+y)(12-y)$$

$$12. m^6 - 49 \\ = (m^3+7)(m^3-7)$$

$$13. x^2 - a^2b^2 \\ = (x+ab)(x-ab)$$

$$14. 81c^4 - 25d^4 \\ = (9c^2+5d^2)(9c^2-5d^2)$$

$$15. 36 - 100k^8 \\ = (6+10k^4)(6-10k^4)$$

$$16. 121h^2k^2 - 36m^2 \\ = (11hk+6m)(11hk-6m)$$

$$17. x^6y^6 - 9 \\ = (x^3y^3+3)(x^3y^3-3)$$

$$18. 5x^2 - 5y^2 \\ = 5(x+y)(x-y)$$

$$19. x^4 - 1 \\ = (x^2+1)(x^2-1)$$

$$20. py^2 - 4p \\ = p(y+2)(y-2)$$

$$21. 4x^2 - 36q^2 \\ = 4(x+3q)(x-3q)$$

$$22. 27x^2 - 75y^2 \\ = 3(3x+5y)(3x-5y)$$

$$23. 8a^2 - 50b^2 \\ = 2(2a+5b)(2a-5b)$$

$$24. 3x^4 - 3y^4 \\ = 3(x^2+y^2)(x^2-y^2)$$

$$25. 12t^2 - 27 \\ = 3(2t+3)(2t-3)$$

$$26. x^3 - 16x \\ = x(x+4)(x-4)$$