

MTH-4106 Factoring and Algebraic Fractions: **Worksheet #1**Factor the following polynomials by **removing the greatest common factor**:

1. $8x^3 + 12x^4 + 4x^5$

2. $6a^2bc + 12a^2b^3c^2 - 18a^2b^2$

3. $16x^3y + 12x^3y^2 - 8x^2y^4 + 20x^2y^2$

4. $2m^2np - 3mn^2p^2 + 5m^3n^3p$

5. $3k^3l^4 - 6k^2l^3 + 18k^4l^2 - 12k^5l^3 + 3k^3l^2$

6. $a^3 - ax$

7. $5ab - 5a^3b^2$

8. $a^2bc + ab^2c + abc^2$

9. $18a^3 - 24a^3b + 12ab^2$

10. $12x^3y^2 - 8x^2y^3 - 4xy$

11. $8m^3n^3 - 12m^2n^2p^5 + 20m^5np^4$

12. $11a^2x^3y - 22b^2x^2y^2 + 33c^2x^2yz$

13. $12a^2x^3y^2 + 9ax^2y^3 - 15a^4x^4y^5$

14. $-h^2k - k^2 - k^3$

15. $-7r^2st + 14rs^2t^2u - 21r^2s^2t^2 - 7r^3s^2t$

16. $x^2y^3 - x^2y^2 + x^2y$

17. $10x^3 - 25x^4y$

18. $-16c + 64c^2d$

19. $6a^2b^3 + 14a^4b^3c$

20. $38x^3y^5 + 57x^4y^2$

21. $5ax^5 - 10a^2x^3 - 15a^3x^3$

22. $48a^3b^2c + 24a^3bc^3 - 16ab^3c^3 + 32ab^2c^4$

23. $3a^4b^2 - 3a^3b + 6a^2b - 9ab^3 + 9a^3b^2 - 12a^2b$

24. $12mx^4y^3 - 18nx^3y - 21x^2y^4 + 6x^2yz$

25. $-9b^2 - 81b$

26. $-8x^3yz^3 - 12x^2y^3z^5 + 20x^5yz^4$

27. $15x^3y - 12x^4y^3z + 7xy^2$

28. $-8m^2n^3 - 4m^4n^2 - 16m^3n^2$

29. $3a^2b^2 - ab^2 + 6a^3b^3$

Answers to Worksheet # 1

1. $4x^3(2 + 3x + x^2)$
2. $6a^2b(c + 2b^2c^2 - 3b)$
3. $4x^2y(4x + 3xy - 2y^3 + 5y)$
4. $mnp(2m - 3np + 5m^2n^2)$
5. $3k^2l^3(kl^2 - 2l + 6k^2 - 4k^3l + k)$
6. $a(a^2 - x)$
7. $5ab(1 - a^2b)$
8. $abc(a + b + c)$
9. $6a(3a^2 - 4a^2b + 2b^2)$
10. $4xy(3x^2y - 2xy^2 - 1)$
11. $4m^2n(2mn^2 - 3np^5 + 5m^3p^4)$
12. $11x^2y(a^2x - 2b^2y + 3c^2z)$
13. $3ax^2y^2(4ax + 3y - 5a^3x^2y^3)$
14. $-k(h^2 + k + k^2)$ or $k(-h^2 - k - k^2)$
15. $-7rst(r - 2stu + 3rst + r^2s)$ or $7rst(-r + 2stu - 3rst - r^2s)$
16. $x^2y(y^2 - y + 1)$
17. $5x^3(2 - 5xy)$
18. $-16c(1 - 4cd)$ or $16c(-1 + 4cd)$
19. $2a^2b^3(3 + 7a^2c)$
20. $19x^3y^2(2y^3 + 3x)$
21. $5ax^3(x^2 - 2a - 3a^2)$
22. $8abc(6a^2b + 3a^2c^2 - 2b^2c^2 + 4bc^3)$
23. $3ab(a^3b - a^2 + 2a - 3b^2 + 3a^2b - 4a)$
24. $3x^2y(4mx^2y^2 - 6nx - 7y^3 + 2z)$
25. $-9b(b + 9)$ or $9b(-b - 9)$
26. $-4x^2yz^3(2x + 3y^2z^2 - 5x^3z)$ or $4x^2yz^3(-2x - 3y^2z^2 + 5x^3z)$
27. $xy(15x^2 - 12x^3y^2z + 7y)$
28. $-4m^2n^2(2n + m^2 + 4m)$ or $4m^2n^2(-2n - m^2 - 4m)$

See above for 29.