Fun with Factoring!

Goals:

1. To factor out a Greatest Common Factor.
2. To factor by grouping.

Q: what does factoring a polynomial mean?

A: you write the poly as a product of other polys.

$12 = (3 \cdot 4)$

↑ a factorization of 12

(ex) Factor out the greatest common factor (GCF).

a) $6t^2 - 12t$

$6t(t-2)$

GCF

$6t(t-2)$

GCF(6, 12) = 6

GCF(t^2, t^1) = t

GCF(x^6, x^4) = x^4

b) $16t^8 + 40t^6 - 24t$

$8t(2t^7 + 5t^5 - 3)$

c) $15m^4n + 30m^5n^2 + 25m^3n^3$

$5m^3n(3m + 6m^2n + 5n^2)$

ex Factor out the negative GCF:

$-2x^2 + 4x^4 - 12x^3$

$-2x^2(1 - 2x^2 + 6x)$

ex Factor: $r(t-3) - s(t-3)$

$(r-s)(t-3)$

equivalent

$(r-s)(t-3)$

or $(t-3)(r-s)$

(ex) Factor by Grouping

a) $y^3 - y^2 + 3y - 3$ ·1

$y^2(y-1) + 3(y-1)$

$(y^2+3)(y-1)$

b) $t^3 + 6t^2 - 2t - 12$

$t^2(t+6) - 2(t+6)$

$(t^2-2)(t+6)$

c) $a^3 - 3a^2 + 6 - 2a$

$-2(-3+a)$

$a^2(a-3) - 2(a-3)$ ✓ $a^3 - 3a^2 - 2a + 6$ ✓

$(a^2-2)(a-3)$

answer

d) $2y^5 + 15 - 6y^4 - 5y$

$2y^5 - 6y^4 - 5y + 15$

$2y^4(y - 3) - 5(y - 3)$

$(2y^4 - 5)(y - 3)$

CW 5.3

① Factor out the GCF: $24x^2y^4 - 18xy^3 - 42x^4y^5$

$6xy^3(4xy - 3 - 7x^3y^2)$

② Factor by Grouping: $xy + xz - wy - wz$

$(y + z)(x - w)$

③ Factor by Grouping: $4x^2 + 8x + x + 2$

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

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

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

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