

### 3. Operations on and factoring of polynomials

#### Practice Problems

Perform the indicated operations and simplify the result:

- $(3x^2 + 5x - 5) - (1 - x - x^2) = \boxed{4x^2 + 6x - 6}$
- $(6x^3 - x^2 + 4) + (x^3 + 2x - 5) = \boxed{7x^3 - x^2 + 2x - 1}$
- $5u^3v(2uv^2 - 3u^2v) = \boxed{10u^4v^3 - 15u^5v^2}$
- $(7x - 3)(x + 5) = \boxed{7x^2 + 32x - 15}$
- $(5t - 2)(5t + 2) = \boxed{25t^2 - 4}$
- $2x(3x + 1)(x - 5) = \boxed{6x^3 - 28x^2 - 10x}$
- $(5x^2 - x + 5) - (3x^2 - 6x - 7) = \boxed{2x^2 + 5x + 12}$
- $(2x^2 - 9x - 1) + (7x^2 - 2x + 7) = \boxed{9x^2 - 11x + 6}$
- $3x^2y^4(6y^2 - 5x^2) = \boxed{18x^2y^6 - 15x^4y^4}$
- $(1 - 3x)(5x - 7) = \boxed{-15x^2 + 26x - 7}$
- $(3x - 5)(3x + 5) = \boxed{9x^2 - 25}$
- $5t^2(5t - 6)(2t + 1) = \boxed{50t^4 - 35t^3 - 30t^2}$

Factor each expression completely:

- $8u^3v^4 - 12u^2v^6 = \boxed{4u^2v^4(2u - 3v^2)}$
- $4 - t^2 = \boxed{(2 - t)(2 + t)}$
- $8u^3v^2 - 18ut^2 = \boxed{2u(2uv - 3t)(2uv + 3t)}$
- $x^2 + x - 2 = \boxed{(x + 2)(x - 1)}$

$$5. 3x^2 + 6x - 24 = \boxed{3(x + 4)(x - 2)}$$

$$6. 6x^3y^2 - 10x^2y^3 = \boxed{2x^2y^2(3x - 5y)}$$

$$7. x^2 - 25 = \boxed{(x - 5)(x + 5)}$$

$$8. 9x^2 - 12x + 4 = \boxed{(3x - 2)^2}$$

$$9. 4x^4y^2 - 9x^2t^2 = \boxed{x^2(2xy - 3t)(2xy + 3t)}$$

$$10. x^2 - x - 2 = \boxed{(x + 1)(x - 2)}$$

$$11. 2x^2 + 2x - 24 = \boxed{2(x + 4)(x - 3)}$$