1. Find the greatest common factor of the following

   (a) 36 and 8

   (b) x^3 and x^{10}

   (c) a^4b^2 and a^3b^3

   (d) $72x^3$ and $18x^2y$

   (e) $49x^3y^4z^2$ and $28x^7y^2z$

   (f) $9x^3$ and $6x^2$ and $12x^4$

2. Use your answers from the previous problem and factor the greatest common factor out of the following expressions

   (a) $36a + 8a^2$

   (b) $x^3 - x^{10}$

   (c) $a^4b^2 + a^3b^3$

   (d) $72x^3 + 18x^2y$

   (e) $49x^3y^4z^2 + 28x^7y^2z$

   (f) $9x^3 + 6x^2 - 12x^4$

3. Factor each expression

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

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

   (c) $2(z + 1) - y - yz$

   (d) $xy + 5y - 2x - 10$

   (e) $2x - xy + 2y - x^2$

   (f) $x^3 + 2x^2 - 9x - 18$

4. Multiply the following and simplify as much as possible

$$(a - b)(a + b)$$

5. Factor completely (use what you learned in the previous problem)

   (a) $49x^2 - 9$

   (b) $x^4 - 16$

   (c) $16 - 81x^4$

   (d) $16x^4 - b^8 \cdot 64$

6. Factor $6ax + 9x - 2a - 3$.

7. Factor the following if possible

   (a) $x^2 + 3x - 28$

   (b) $x^2 - 3x + 2$

   (c) $2x^2 - 4x - 6$

   (d) $w^2 + 7w + 10$

   (e) $(x + y)^2 + 7(x + y) + 10$

   (f) $2x^3 + 10x^2 + 12x$

   (g) $x^4 - 3x^2 - 4$