[factoring polynomials]

1. Expand and simplify:

   a. $7a^2 - 2(3a - 4) + 3a(5 - 2a)$
   b. $3(4a - 1)^2 - (2a + 1)(4a - 3)$
   c. $(a - 2)(2a + 3b - 5)$

2. Simplify and state the restrictions:

   a. $\frac{-54a^3b^2c^5}{27ab^4c^3}$
   b. $\frac{a^2-a-12}{a^2-4a}$

3. Factor fully:

   a. $5a^2b^3 - 20a^3b^4$
   b. $a^2 - 7a + 12$
   c. $9a^2 - 25b^2$
   d. $(a + 2)^2 - 49b^2$
   e. $8a^2 - 10a - 7$
   f. $4a^2 - 4a + 1 - 9b^2$
   g. $7a^2 - 28a - 35$
   h. $ax - ay - bx + by$
   i. $4a^3 - 8a^2 - 25a + 50$
   j. $a^2 + 2a + 1 - x^2 - 2xy - y^2$

4. Simplify (restrictions **not** required):

   a. $\frac{4a^2-8a}{a^2-5a+6} \times \frac{a-3}{a^2-9}$
   b. $\frac{8xy}{x^2-4} \div \frac{16x^2}{3x-6}$
   c. $\frac{6a^2+13a-5}{2a^2+3a-5} \times \frac{4a^2-4}{9a^2-1}$
   d. $\frac{5x}{4} + \frac{3}{5x} - 1$
   e. $\frac{3}{x-4} - \frac{7}{x+3}$
   f. $\frac{5a+1}{a^2-4} + \frac{4a}{a^2+5a+6}$