1. Factor each polynomial. In some cases, some grouping parentheses are already in place to help you finish the factoring.

   a) $x(x+2)-4(x+2)$

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

   c) $7x^2(5x+4)+5x+4$

   d) $x^2+3x-5x-15$

   e) x^3-x^2+2x-2

   f) $xy-x+5y-5$

   g) $3x^3-2x^2-6x+4$

   h) $x^2+2xy+3xz+6yz$

2. Decide if the statement or math work is true/correct or false/incorrect. If it is false/incorrect, explain what exactly is wrong with it.

a)
$$\begin{aligned} & a(x-7)+b(7-x) \\ &= a(x-7)+b(-1)(x-7) \\ &= a(x-7)-b(x-7) \\ &= (a-b)(x-7) \end{aligned}$$

b)
$$\begin{aligned} & a^2+b^2 \\ &= a^2+ab-ab+b^2 \\ &= a(a+b)-b(a+b) \\ &= (a+b)(a-b) \end{aligned}$$

c) $-4x^2+12x$ can be factored as $-4x(x-3)$ or $4x(-x+3)$.

d) Since the GCF of $9x^3+6x^2+3x$ is $3x$, it is not necessary to write a 1 when $3x$ is factored from the last term.

3. There was a rectangular box with all three edges of different length. After you had computed the volume of the box, you had found that the volume was

$$x^3-3x^2-25x+75$$

measured in cubic inches, where x is in inches. Find one possibility for the height, width, and depth of the box.