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1. **a)** $(2a+7)(3x-4)$ **b)** $(9x-2)(4y-1)$ **c)** $(x^2+1)(x+1)$
   d) $(5a+6)(3ab+4)$ **e)** $(x+y)(ay-x)$ **f)** $(2a+5b)(2ab-4)$

2. Factoring $20-4x+5y-xy$ by grouping, $(4+y)(5-x)$ is obtained.
   This expression must be interpreted by keeping in mind the context to conclude that Jason rented 4 movies at \$5 each.

3. **a)** $^-5$ and 6. **b)** $^-12$ and $^-4$. **c)** $^-12$ and 2.
   d) 8 and 4. **e)** $^-6$ and 6. **f)** $-\frac{9}{2}$ and $^-4$.

4. **a)** $(x+4)(12x+1)$ **b)** Impossible. **c)** $(2x-3)(5x+1)$
   d) $(x+4)(6x-1)$ **e)** $(8x-3)(5x-2)$ **f)** $(5x+3)(2x-3)$
   g) $(4x-5)^2$ **h)** $(5x-8)(5x-2)$ **i)** $(4x+3)(6x-5)$

5. **a)** $(3x+2)(x+5)$ **b)** $(3x+10)(x+1)$ **c)** $(3x-2)(x+5)$
   d) $(3x+10)(x-1)$ **e)** $(3x-5)(x+2)$ **f)** $(3x-5)(x-2)$
   g) $(3x+2)(x-5)$ **h)** $(3x+1)(x-10)$ **i)** $(3x-1)(x-10)$

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6. **a)** $(x+8)(x-4)$
   b) $(x-5)(x-2)$
   c) $(x+6)(3x-2)$
   d) $(2x+1)^2$
   e) $(4x+1)(x-4)$
   f) $(6x-1)(x-1)$
   g) $(3x+4)(2x+3)$
   h) $(5x+3)(2x-1)$
   i) $(6x+5)(2x-3)$

7. a) $(2x - 1)(3x - 2)$

b) The expression that could represent the height is $3x - 2$. *Several approaches possible. Example:* The area of the trapezoid is determined by using the formula $A = \frac{(b + B)h}{2}$.
Knowing that the height is equal to the length of the big base B and the small base b measures x, one can state $(h + x)h = 2A$
$= 2(2x - 1)(3x - 2)$
$= (4x - 2)(3x - 2)$.
One can establish that the two factors on the left have a difference of x, and the same also goes for the two factors on the right. The equality would be true if $h = 3x - 2$.

8. a) $(4x - 21)(x - 1)$ **b)** $(2x - 5)(2x + 5)$ **c)** $(2x - 5)^2$
d) $(x^2 + 5)(x - 4)$ **e)** $(5x + 2)(x - 3)$ **f)** $(4x - 1)(3x + 2)$
g) $(-5x + 1)(3x + 2)$ **h)** $(3x - 2)(2x + 5)$ **i)** $2x(3x - 5)$
j) $(8x + 5)(2x + 5)$ **k)** $(4x - 5)^2$ **l)** $(8x^2 + 5)(2x + 5)$
m) $(4x^2 - 5)(4x^2 + 5)$ **n)** $(3x - y)(x - 8y)$ **o)** $7xy(7x - 6y)$
p) $(5xy + 1)(xy + 3)$ **q)** $(7xy^2 - 3)^2$ **r)** $(3xy - 2)(2x - 3y)$

9. a) The surface area of the box is the sum of the area of its 6 sides, and this area must be 1720 cm^2. Therefore:

$$2x(x + 1) + 2x(x + 5) + 2(x + 1)(x + 5) = 1720$$
$$2x^2 + 2x + 2x^2 + 10x + 2x^2 + 12x + 10 = 1720$$
$$6x^2 + 24x + 10 = 1720$$
$$6x^2 + 24x - 1710 = 0$$
$$x^2 + 4x - 285 = 0$$

b) The solution for $x^2 + 4x - 285 = 0$ is $x = 15$ or $x = -19$.
The value of x must be positive since it represents the height of the box; it is therefore 15. By evaluating the other expressions using $x = 15$, the other dimensions of the box are found. It therefore measures 15 cm by 16 cm by 20 cm.