Math 123 Name_____
Exam 1
Fall 2011 Show All Work

1) Perform the indicated operations and simplify.

a) $(4x - 3)(2x - 1) = (4x)(2x) - (4x)(1) - 3(2x) + (-3)(-1)$
$= 8x^2 - 4x - 6x + 3$
$= 8x^2 - 10x + 3$

b) $(x + 2)(x^2 - 4x + 1) = x(x^2 - 4x + 1) + 2(x^2 - 4x + 1)$
$= x^3 - 4x^2 + x + 2x^2 - 8x + 2$
$= x^3 - 4x^2 + 2x^2 + x - 8x + 2$
$= x^3 - 2x^2 - 7x + 2$

2) Factor each polynomial **completely**.

a) $x^3 - 8 = (x - 2)(x^2 + 2x + 4)$

NOTE
$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

b) $2x^2 + 10x - 12 = 2(x^2 + 5x - 6)$
$= 2(x + 6)(x - 1)$

3) Multiply or divide as indicated. Write all answers in lowest terms.

a) $\frac{x^2 + 4x - 5}{5x} \cdot \frac{x^2 - 2x}{x^2 - 3x + 2} = \frac{(x + 5)(x - 1)}{5x} \cdot \frac{x(x - 2)}{(x - 2)(x - 1)} = \frac{x(x + 5)}{5x} = \frac{x + 5}{5}$